JANUARY 2000
Volume 68 No 1

Amateur Radio

WIRELESS INSTITUTE OF AUSTRALIA

- Converting Computer Power Supplies
- Another Inductance Meter
- Small HF Loop Antennas
- "anti-ARDF" — APRS

Taking it all to the great outdoors – the Field Day season in full swing

- Musen FL2000B revamped
- The ACT 3.5

WIA Yearbook 2000

- Callbook Listings
- Frequency Listings
- Band Plans
- Repeater Lists
- Beacon Lists
- Satellite Lists
- Licence Conditions
- Examiner Lists
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- Public Relations Notes
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- and much, much more !

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Amateur Radio

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Montage of Field Day photos

Clockwise from top: Steve VK5AIM, John Moyle Contest 1999; Terry Grummer VK6TRG. WA VHF Group Field Day; Colwyn VK5UE , Field Day 1997 Wongalere; Property VK7JGD. John Moyle Field Day 1997

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Amateur Radio is a forum for WIA members' amateur radio experiments, experiences opinions and news. Manuscripts with drawings and or photos are always welcome and will be considered for publication. Articles on disc or email are especially welcome. The WIA cannot be responsible for loss or damage to any material. A pamphlet, How to write for Amateur Radio is available from the Federal Office on receipt of a stamped self-addressed envelope.

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Disclaimer
The opinions expressed in this publication do not necessarily reflect the official view of the WIA and the WIA cannot be held responsible for incorrect information published.

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A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs; that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Wireless Institute of Australia

The world's first and oldest
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Founded 1910

Representing
The Australian Amateur Radio Service

Member of the
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EDITORS COMMENT

What's new in Amateur Radio?

Welcome to January 2000.

A New Year and a new editor. I am Colwyn Low VK5UE. I have edited the WIA SA Division Newsletter for three years.

A LITTLE BACKGROUND, I came to Amateur Radio and electronics at High School and University. I held the call GI3MCZ and worked from the University Amateur Radio Club station for a few years before moving to a school in County Fermanagh. There I made use of my Morse qualification and worked Top Band CW for about four years. On migrating to South Australia and WRE Salisbury I obtained the call VK5UE and went dormant for some years. I took part in Elizabeth Amateur Radio Club John Moyle Field Days and JOTA. The Field Day stations were big and needed a 25kVA generator!!

So now "What is new in Amateur Radio" ?. The US FCC have set in place a major revision of licencing from April 2000: three classes of licence (Technician, General and Amateur Extra) and a 5wpm Morse test. This will anger some people, but we have to accept reality and have qualifications appropriate to to-day. I can assure you Morse will be heard on Amateur Bands for many years to come because Morse is the appropriate mode for some activities. QRP and VHF/UHF distance records will continue to use CW. Further, you can communicate with Morse abbreviations when you have no knowledge of the other Amateur's native language. Sure digital modes and computers will be used by many, but so will SSB and FM and PSM etc.

The big problems we as Amateurs have to-day are populating our extensive frequency allocations and keeping our exclusive allocations. These require us to be active on the air and to promote Amateur radio to friends and contacts, to youth groups, to schools and to Adult Education groups. Note Redcliffe ARC University of the Third Age Amateur Classes.

Then there is WICEN. The WICEN support of the Emergency Services keeps Amateur radio in touch with Government Authorities. Its exercises in providing communications to Car Rallies, Canoeing events, Yacht races etc is important to keep Amateur Radio in the Public eye.

Finally we have all to remember that it is the volunteers who keep the WIA going. We could not afford to pay staff to do all that is necessary to keep Amateur Radio alive in Australia. Those who knock the WIA have not yet made a practical suggestion on what should replace it. The WIA may need continual reform but better modify what works than start research for a prototype, which will not be ready for a decade.

Colwyn, Editor.

The

CLUB NEWS

pages are your pages

for news of your activities, or to publicise your events

Send information to

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Channel 35 available for another year

The following is the text of a letter from the Australian Communications Authority to WIA Federal President Peter Naish VK2BPN, regarding the extension of the UHF television Channel 35 "drop-through" to the Amateur Radio Service.

File Reference: X96/918 & X95/1391

Mr Peter Naish
Federal President
Wireless Institute of Australia
PO Box 2175
CAULFIELD JUNCTION VIC 3161

Dear Mr Naish

AUSTRALIAN BROADCASTING AUTHORITY DROP-THROUGH FOR UHF TELEVISION CHANNEL 35 (575 - 582 MHz)

I refer to my 7 September 1998 letter advising that the Australian Broadcasting Authority (ABA) had indicated that the drop-through for UHF television channel 35 would not be extended as UHF television channel 35 would be required for digital television in the near future.

Recently, the Australian Communications Authority received formal advice from the ABA that it has reconsidered the continued use of UHF television channel 35 for Amateur television services. Under section 34 of the [italics on] Broadcasting Services Act 1992 [italics off], the current drop-through period for UHF television channel 35 (575 - 582 MHz) has been extended at **four** (of the current five) sites until 31 December 2000. The decision by the ABA is based on licensees accepting interference from digital television test transmissions, and that neither they nor their viewers will claim protection from such interference. (An appropriate special condition will be attached to licences is, and when, they are renewed.)

The four sites for which the drop-through has been extended are:

Lane Cove, New South Wales;
Springwood, New South Wales;
Spring Hill, Queensland; and
O'Halloran Hill, South Australia.

Services at these sites must operate wholly within the drop-through band for channel 35 (575 - 582 MHz), must accept interference from digital television and must not claim protection from such interference, and must cease operation by midnight on 31 December 2000.

The current drop-through for Olinda, Victoria, **cannot be extended** as the ABA has allotted channel 35 for use by digital services in Melbourne under the Digital Channel Plan. Therefore, the Amateur television service at Olinda **must** cease operation by midnight on 31 December 1999.

It should be noted that the extension of the drop-through does not apply to licensees who have changed operating frequency to a frequency other than channel 35 (to the amateur bands for example).

Yours sincerely

Alan Jordan
Manager
Radiocommunications Licensing Policy Team
Radiofrequency Planning Group
7 December 1999

Comment

Federal President, Peter Naish VK2BPN.

We enter this new year on a very positive not, beginning to see the benefits of some important decisions made during the past couple of years. Our relationships both internally and externally are once again working well.

Our house journal, *Amateur Radio*, is a key element of our services to you, the members of WIA. With the retirement of our long serving Editor, Bill Rice, at the end of last year we now have a new man on the job.

Colwyn Low has agreed to take on the responsibility for editing and managing the magazine at least for the next few months. Please welcome him to the WIA Editor position and give him all the support that this important task requires.

While on the subject of *Amateur Radio*, I am hopeful that recent improvements which we have put in place will enable us to deliver it you in a more timely manner. I am confident that this publication will be of high quality and maintain its topical nature.

The WIA ACA Liaison Committee met with ACA in Canberra during December and progressed a number of key matters. A full report on these will be included in next month's issue of this journal but I can say that the WIA and ACA have reached preliminary agreement on several points that will bring benefit to the amateur radio service in Australia.

Our discussions included amateur access to spectrum in the LF Band, possible future return to co-primary status of frequencies in the six metre band, clarification on some licencing arrangements in regard to reservation of suffixes in the WIA-WIZ group and use of higher power output for special purposes, linking of repeaters plus a number of other issues.

As is usual, the outcome from these discussions will take a while before any actual benefits can become effective. There are still a number of hurdles to be overcome, some administrative but others of a political nature within ACA and the communications ministry.

However, your committee was pleased with the positive reaction by ACA to our requests and the overall trend to success. During 2000 we will be able to finalise a number of matters on your behalf.

Peter Naish, VK2BPN
WIA Federal President.

WIA News

WIA News Prepared, researched and compiled by
David Thompson VK2NH
Federal Public Relations Coordinator.

Y2K – Why the Fuss?

Writing this in early December 1999, I can only hope that that is the question we were all asking in early January 2000. Despite all the remedial work and planning carried out to minimise the effects, there will have been many unexpected manifestations of the misnamed "Millenium" Bug

Perhaps now it's time to look forward to the 21st century (whether or not you think it has already begun!) and think about ways we Amateurs can all move forward and embrace the Information Age.

WIA Yearbook 2000 Now Available

At long last, the *WIA Yearbook 2000* is now available from your Divisional bookshop. The change of name reflects the expanded content of the yearbook, which has nearly doubled in size, and now contains much material new to this edition. As well as the latest Amateur callsigns, repeater and beacon listings, and reference data, the *Yearbook* now includes new articles and features of interest to shortwave listeners, Cbers, radio astronomy fans, other special interest groups. The *Yearbook* should also be available through the usual retail outlets.

Amateur Television – UHF Channel 35 Lives On!

As most ATV enthusiasts are aware the 50cm band was officially withdrawn from Amateur use in 1989, but that the Australian Broadcasting Authority has allowed Amateurs to continue using UHF TV channel 35 on a "drop-through" basis until the channel was required by local broadcasters.

The "drop-through" was scheduled to end for good in December 1999, but has been extended for another 12 months, following representations from ATV repeater licensees in several parts of Australia.

Full details were not available at time of writing, but it is known that the Brisbane ATV repeater VK4RTV has been given permission to remain on '35 subject to interference which may result from SBS Digital Television tests. The other four existing ATV repeaters have also been given permission to remain on channel 35 with similar conditions.

Channel 35 is potentially a most valuable resource for introducing Amateur Radio to the general community. In Sydney, many non-Amateurs watch the regular Amateur transmissions on VK2RTV – even visitors staying at some city hotels tune can watch these transmissions.

ACA updates Amateur Operating Procedures

The Australian Communications Authority has updated its *Amateur Operating Procedures* booklet on its web site. The updated document can be accessed at *http://www.aca.gov.au/publications/info/regs.htm*

Another document, *Disclosure of Personal Information* has also been revised. This may be of interest to anyone concerned about their station location being publicised on the Internet. The document is located at http://www.aca.gov.au/publications/info/privacy.htm (Since the database of radiocommunications licencees was first published a couple of years ago, the New South Wales Division of the WIA has offered its members the use of a post office box for licence renewals, for a nominal fee. It is this address that appears on the web site rather than the station's physical address.)

Finally, for readers who might still use the Citizens Bands, the updated CB Class licence information is at *http://www.aca.gov.au/publications/info/cbrcl.htm*

How Healthy is your Club?

Following on from some vigorous discussion on the packet network about the future of Amateur Radio, Lee de Vries VK3PK is gathering information about trends in club membership numbers.

Lee has asked that secretaries and treasurers of Amateur Radio clubs contact him with statistics about club membership levels.

If you would like to assist Lee in his study, please contact Lee at his callbook address.

New 10m beacon in Victoria

Still in VK3, Mark Harrison VK3BYY (m.harrison@medoto.unimelb.edu.au) has announced a new beacon for the ten metre band.

VK3RMH is now operational on 28.2565 MHz, from a site about 25km northeast of Melbourne (grid square QF22JH). Its power output is 20 Watts ID and carrier with a 2 Watt carrier step.

The antenna is a half-wave vertical on North side of the site's tower (directing North)

The beacon's Morse identification cycles through two messages, each followed by a 20 Watt carrier and 2 Watt carrier for 5 seconds each.

The ID messages read: "VK3RMH MELB QF22JH 20/2W VERT" and "VK3RMH AT HOTMAIL.COM QSL"

Signal reports may be sent via Internet email to vk3rmh@hotmail.com, or to m.harrison@medoto.unimelb.edu.au, to whom further enquiries may be directed.

The beacon has been established by the North East Radio Group, Inc. , whose address is P.O. Box 270, Greensborough, Victoria, 3002.

From the Internet rec.radio.amateur.misc newsgroup

VKG Insecurity

Plans to install a high security digital radio network have been put on hold and police may have to rely on their existing analog system for the Olympics.

The head of the police communications group, acting Chief Superintendent Dan Dillon, has recommended that the service put off a decision on the supplier of equipment for a new $$27 million network.

But there are serious concerns about the capacity and security of the aging network after hackers gained access last year and broadcast threats to police in Sydney.

A digital system would be more secure and efficient and reduce congestion by allowing for the creation of more radio channels.

(VK4BAT) via QNEWS

Improved Communications for Sydney-Hobart Yacht Race

In an effort to avoid the tragic loss of life that struck the 1999 Sydney to Hobart Yacht race, competitors in this year's event had the benefit of greatly improved communications.

Last year's race was marked by severe storms in Bass Strait, which necessitated a number of rescue operations in very difficult conditions. Six competitors lost their lives during the event.

Each boat in this year's event was fitted with Satcom-C satellite transceivers, providing real-time position information for every vessel. As well as making the job of the rescue services easier, the systems allowed fans to track the progress of their favourites on the race web site. The Satcom-C radios also allowed competitors to receive up-to-date weather information, essential in the rapidly-changing conditions that characterise the race.

The real-time position reporting was an improvement over previous years, when positions were reported only twice daily via voice radio links to the organisers.

The position reporting system also allowed rapid identification of vessels in trouble much more easily than last year, when many boats had simultaneously activated their Emergency Position Indicating Radio Beacons (EPIRBs), which carry no vessel identifying information.

On top of this, many of the individuals on board were encouraged to carry personal EPIRBs, allowing them to be located more easily if washed overboard.

Finally, all vessels carried a special waterproof VHF handheld, and monitored a special race channel around the clock for emergency traffic.

Adapted from a story in Wired News, via Ham Radio Newsline

NASA's Bandwidth Squeeze

NASA's Deep Space Network is facing increasing bandwidth problems, trying to stay in communication with more than 40 active space missions from its earth stations in California, Canberra, and Madrid.

In the words of Jet Propulsion Laboratory spokesman, John Watson, "There's just 24 hours in a day and only so many antennas."

Payload restrictions on each spacecraft limit the size, weight, and power consumption of onboard communications equipment, and that has implications for the bandwidth of signals transmitted by each spacecraft.

The bandwidth challenges have inspired engineers to be smarter about how they communicate with the spacecraft; newer space probes are being designed to be more autonomous, requiring fewer commands from Earth.

NASA's space communications centre on the 2GHz S-Band, and the X-Band around 8 GHz, but now engineers are considering moving up to the Ka-Band at 32 GHz.

JPL was experimenting with Ka-Band data communications on the Mars Polar Lander and Cassini missions, but unfortunately the Polar Lander was lost in early December 1999. NASA does not expect to make regular use of the Ka-Band until at least 2005, as there are a number of technical challenges to overcome, such as accurately tracking the signals.

After Ka-Band will probably be light waves; successful preliminary tests have already been carried out on one Japanese spacecraft.

Adapted from a story in Wired News, via Ham Radio Newsline

Amateur Radio crosses Korean DMZ

The first-ever amateur radio communications between North and South Korea took place November 22. Amateur radio operator Yi Tong-kyu was surprised when he checked his communications record on the afternoon of 21 November. He discovered the country code P5, which signifies that the source was North Korea. He thought it was a trick to pretend to be from North Korea and ignored it, but he saw P5 again on the 22nd.

Yi succeeded to communicate and found that the sender was someone presumed to be a Japanese visiting North Korea. They communicated for about just a minute, but it was the first radio communications between the North and South since national division.

Yi Tong-kyu said the government has approved communications with foreigners [in North Korea], and it was the first of its kind since the approval.

Martti Laine, OH2BH, operated as P51BH for a couple of hours on 21 April 1999, making 263 QSO's on 20 metres CW and SSB and 15 metres SSB. Martti built the Ham facility in North Hamgyong Province in May. The signals were from that facility.

The law in force only approves communications with foreigners residing in North Korea, but this first successful North South communications make locals hopeful communications barriers with North Korea would gradually diminish.

(Source:- Seoul KBS-1 Television Network in Korean/ RSGB in United Kingdom) via QNEWS

ar

WIAQ new members November 1999

Frank Tieppo VK4CBT of Windsor
Klaus Merretz VK4HCC of Toowoomba
Gary Coutts VK4GAZ of Southport
Gary Mehlert VK4FT of Mt Warren Park

The ACT 3.5

A five-watt direct conversion CW transceiver for 80 metres

by Peter Parker VK3YE
12/8 Walnut Street, Carnegie, Victoria, 3163
E-mail: parkerp@alphalink.org.au

Are you looking for a simple 80 metre CW rig for portable operating or for the monthly 80 metre QRP scrambles? One that covers the whole 80 metre CW segment, delivers the QRP power limit, yet is fairly simple to build? If so, the ACT-3.5 might be just what you're looking for.

Photo 1: Completed ACT 3.5 Transceiver

THE ACT 3.5 TUNES between 3.500 and 3.550 MHz and puts out five watts. It features a simple direct conversion receiver, a sidetone and relay-controlled transmit-receive switching. An LED shows when the key is down and a meter gives a relative indication of transmitted RF output. Unlike many simple QRP rigs, it features reverse-polarity protection.

The completed transceiver is pictured in Photo 1. The case is small enough for portable operating, yet is large enough for easy construction. It could be made smaller if the constructor elects to build only the transmitter and uses it in conjunction with an HF communications receiver.

Circuit description

Fig 1 shows the block diagram for the ACT 3.5. A 3.58 MHz ceramic resonator oscillator pulled down to the CW segment provides the local oscillator signal required by both the transmitter and the direct conversion receiver. A two transistor buffer from *Solid State Design for the Radio Amateur* provides isolation between the oscillator and the Driver/PA stages during transmit. The driver and PA stages are similar to those used in many transmitter circuits by Drew Diamond VK3XU and provides up to 5 watts on 80 metres. A two-stage pi-network attenuates any harmonics before the transmitted signal is sent to the antenna via the transmit/receive relay. The use of voltage regulation in the supply line to the oscillator assists in keeping the transmitted frequency stable.

The receiver is a very basic direct conversion NE602 type, not unlike that used in Drew Diamond's *Little Mate* transceiver. Economies have been made in the circuitry surrounding the 741 op-amp and the use of a BC548 instead of an LM386 for the final audio amplifier stage. Despite the lower gain, the received volume is still sufficient if medium to high impedance headphones (eg 600 ohm) are used.

When the key is pressed several things happen. The collector voltage of the PNP keying transistor increases to approximately 12 volts. This voltage provides bias to the power amplifier stage, powers the sidetone, lights the Transmit LED and energises the relay. This causes 12 volts to be applied to the drain of the power amplifier and the antenna to be connected to the transmitter section. Releasing the key causes the LED to extinguish, relay to release, voltage to be removed from the PA stage and the antenna to be switched to the receiver module.

The sidetone is an optional extra.

However its inclusion makes operating more pleasant. The design used in the prototype again came from Solid State Design. It provides sufficient volume to allow its output to be fed directly to the headphones without additional audio amplification being required.

The meter on the front panel is a legacy of the previous project built inside the case. Removing it would have left a large and ugly hole that would be difficult to cover up, so it was decided to leave the meter and make use of it instead. An RF choke, diode and sensor wire near the pi-network provide a cheap but effective indicator of relative transmitted RF. This embellishment can be omitted if all you want is a 'bare bones' transceiver.

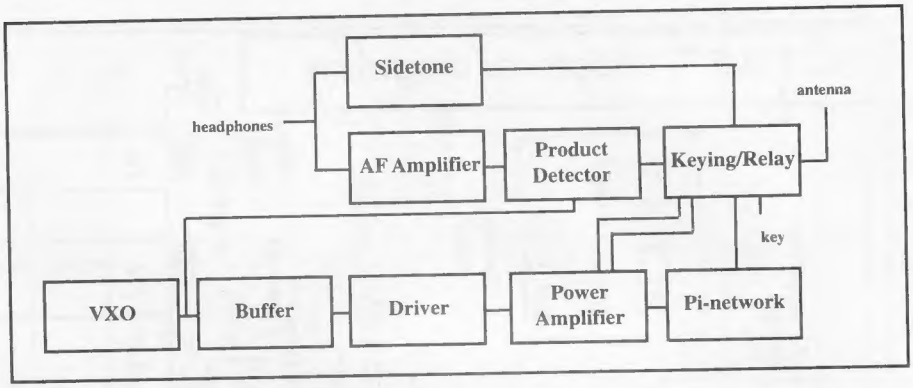

Figure 1: Block diagram ACT 3.5

Construction

Use a metal box to house the transceiver. The prototype measured 6x17x14 cm and comfortably accommodates all stages. The ACT 3.5 pictured follows the conventional practice of having the antenna socket on the rear and the controls, switches and sockets on the front panel. However, if you often operate from remote spots and use the rig on the ground, you may consider mounting all dials, meters controls and sockets on the top lid so they can be easily be seen by the operator without bending down.

The ACT 3.5 circuitry comprises six modules. These are:

i. Ceramic resonator oscillator/buffer/driver board
ii. Transmitter power amplifier/low pass filter board
iii. Power/keying/relay board
iv. Receiver board
v. Sidetone board
vi. Relative output meter

Most modules are built in 'dead bug' style on pieces of printed circuit boards that form sub-chassis inside the case. The Receiver and Power/keying/relay stages are constructed on pieces of blank matrix board. The two components used for the relative output meter are mounted on the back of the meter movement.

1. Ceramic resonator oscillator/buffer/driver board

This module provides the 3.5 MHz signal required by both the transmitter and receiver and sufficient RF drive to the power amplifier.

The selection of tuning capacitor and vernier drive plays a key role in determining whether operating the rig will be a pleasure or a chore. The author was fortunate to obtain an air-spaced tuning capacitor with an inbuilt 3:1 vernier reduction drive. This provided good bandspread across the most used CW frequencies. If your capacitor has no bandspread, it is definitely worth your while to invest in an external vernier reduction drive such as that stocked by Dick Smith's (catalogue P-7170).

As to the choice of the variable capacitor itself, an air-spaced unit is preferred as it provides better frequency stability and usually has a spindle long enough to fit a vernier drive. However, the author has used the commercially-available plastic dielectric variable capacitors with other 80 metre ceramic resonator transceivers and has found them reasonably satisfactory.

The printed circuit board material used to mount the oscillator/buffer/driver stages is bolted to the back of the variable capacitor inside the box. Leads should be kept short to minimise stray capacitances and maximise frequency swing.

Build the VXO and buffer first. Check that 8 volts is present on the collector of the BC548 and try to locate the carrier generated on a nearby 3.5 MHz receiver. Vary the tuning capacitor to see what frequencies can be covered. If there is coverage below 3.500 MHz, reduce the value of the 100pF capacitor between collector and earth until all of the tuning range falls within 80 metres. If high frequency coverage (above 3.540 MHz) is lacking, adjust any trimmers on the variable capacitor to near minimum capacitance. It is quite normal for the tuning of variable ceramic resonator oscillators to be non-linear - the bottom 10 kHz of the band will take up most of the rotation on the variable capacitor. Note that there are variations between different makes of ceramic resonators - the orange/brown type from Vorlac requires less capacitance to cover a given frequency than do the blue RS type used in the prototype.

Once satisfied with the tuning range and frequency stability of the variable ceramic resonator oscillator, construct the driver. Do not forget the ferrite bead on the base of the driver transistor - this reduces the risk of self-oscillation. When the driver is added the signal in the receiver should be considerably stronger when the collector of the 2N3053 is touched with a finger.

2. Transmitter power amplifier and pi-network

As mentioned before, this module is almost a straight lift from many of Drew

text continues on page10

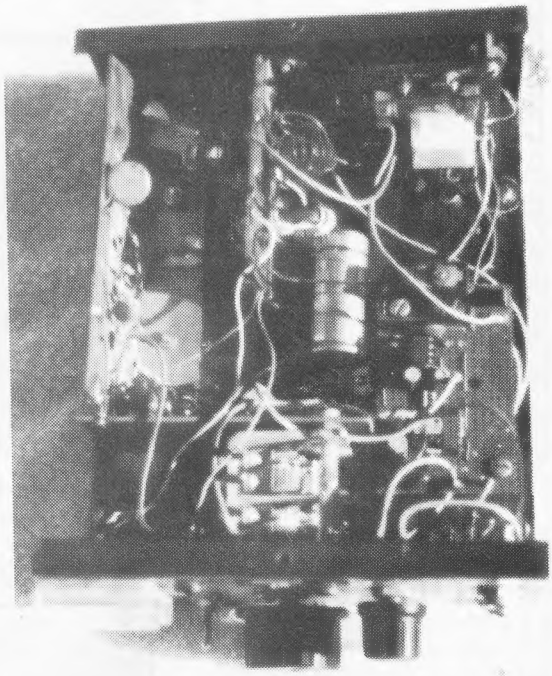

Photo 2: Inside of ACT 3.5. Clockwise from variable capacitor: VXO/Buffer/Driver, sidetone, PA, Pi-network, Power/Keying/Relay, receiver.

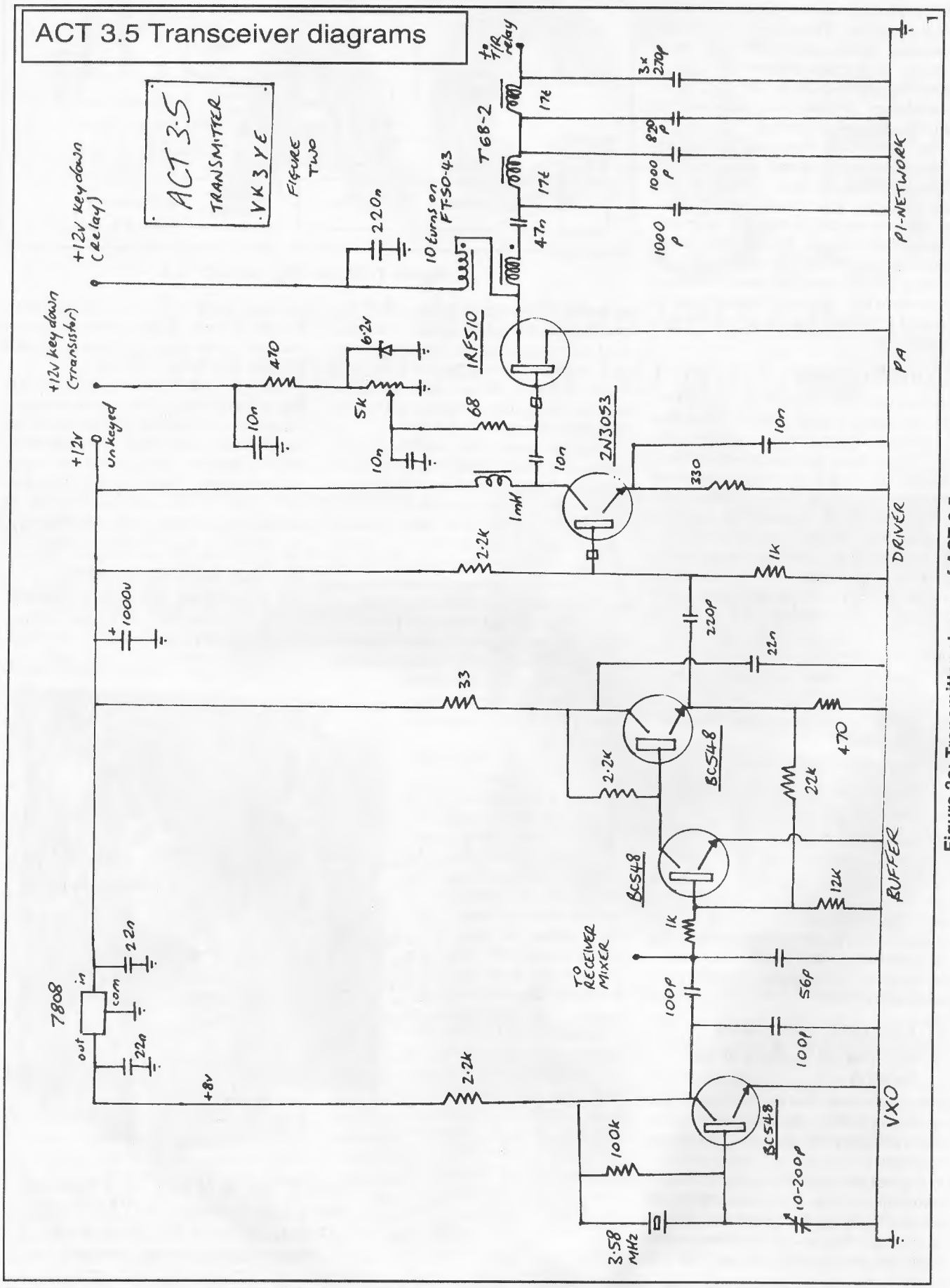

Figure 3a: Transmitter stages of ACT 3.5

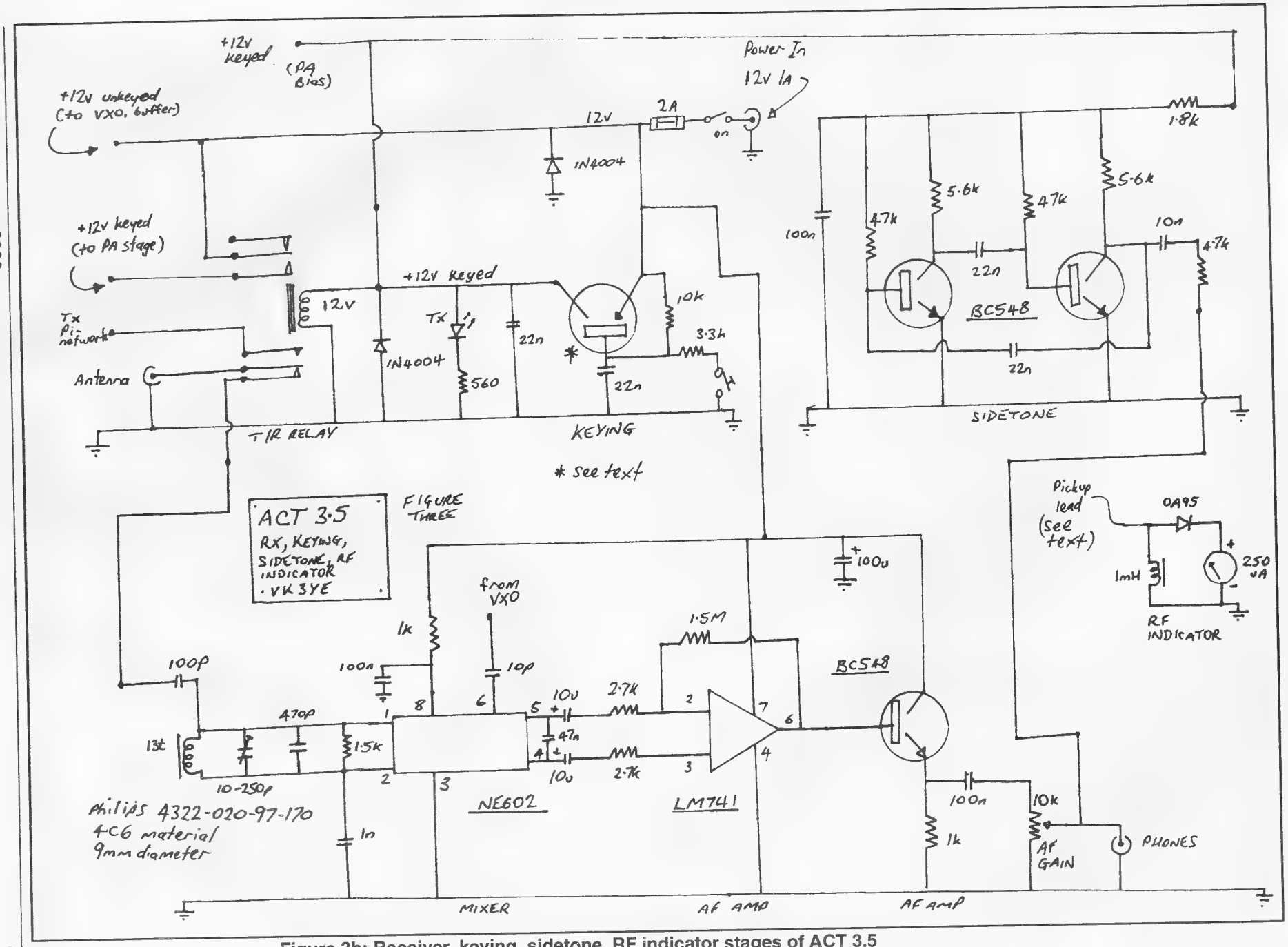

Figure 3b: Receiver, keying, sidetone, RF indicator stages of ACT 3.5

continued from page 7

Diamond's recent transmitter projects. Important things to watch for include the polarity of the zener diode and the toroid windings, the need for a heatsink on the IRF510, and the setting of the 5k trimpot. The pi-network in the prototype used salvaged silver mica capacitors. If these are not available use polystyrene capacitors - these are less lossy than ceramics at RF. Again connections around this stage should be kept short to minimise stray capacitance. Amidon T-68-2 toroids were used in the pi-network because they were on hand. However T-50-2 toroids are more common in QRP transmitter circuits. If using T-50-2 toroids, wind 21 turns onto the toroid instead of the 17 specified.

To test, connect a 50 ohm dummy load and RF power meter (0 to 20 watt range suggested) to the output of the pi-network. Apply power to ceramic resonator oscillator/buffer/driver board and the two PA connections that will eventually go to the keying/relay board.

Touch the tops of the driver and PA transistors to check that they are not uncomfortably hot. Slowly advance the 5k trimpot to increase indicated power on the meter to 4-5 watts. This occurred in the prototype when the trimpot was about 75 percent of its travel away from earth.

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3. Power/keying/relay board

This is one of the simplest stages in the transceiver, but plays a large part in making the rig smooth to operate. It consists of a relay switched by a medium-power PNP transistor. This is not specified on the diagram - the one used in the prototype was an unknown junkbox type. However, a BD140 or TIP32 should be suitable. The main things to watch are the connections to the relay contacts - any errors here could result in the rig behaving very strangely indeed. The polarity of the diode across the relay is also critical.

Testing this stage consists of pressing the key and observing whether the LED lights and the relay pulls in.

4. Receiver board

This board is not needed if all you require is a transmitter. Again it borrows heavily from the *Little Mate*. Because of the use of ICs, all parts are mounted on a piece of unclad perforated circuit board.

A single, high-Q tuned circuit provides front-end selectivity for the NE602 mixer stage. This stage beats the incoming signal with the local oscillator to produce an audio output. Some top-cut is provided by the 47n capacitor across pins 4 and 5. The audio is then amplified by the 741 and BC548 stages. Gain is sufficient even for QRP signals, but there isn't much to spare - the AF gain control is usually set at maximum and left there except when signals are strong. Audio from the sidetone is coupled directly to the high impedance headphones.

A number of hard to obtain components are used in the receiver section. These include the NE602, the 10-250 pF compression trimmer and the 9 mm toroid. The toroid is a 9mm diameter, Philips 4322-020-97-170, 4c6 material type. Information on obtaining these is given later.

Adjustment of the trimmer capacitor is critical to receiver performance. Because the tuned circuit is sharp, poor adjustment will mean low sensitivity. However, bandwidth is sufficient to provide acceptable performance across the transceiver's entire tuning range.

5. Sidetone

This is a two transistor design borrowed from *Solid State Design*. It is only needed if you are building the full transceiver. The unit in the prototype was built dead-bug style on a piece of unetched printed circuit board material. Because a sufficient number of components used have one connection earthed, no stand-offs, insulators or pads were required to support the other components.

6. Relative output meter

As mentioned before,. the transceiver includes a meter for relative RF output. Like the meter in the Heath HW8, it has no function on receive. The meter circuit is built after all other transmitter stages have been constructed. The two components required are soldered to the back of the meter. There is no direct connection between the relative RF meter circuit and the rest of the transmitter. Instead the meter uses a pickup wire which is loosely coupled to the RF-carrying wire between the PA stage and the pi-network. This end of the pickup wire is then soldered to ground. Experiment with the amount of coupling if the meter needle shoots off the end of the scale or barely moves.

Availability of parts

About 95 percent of the components used in this transceiver are available from regular parts suppliers such as Dick Smith Electronics. The CW Operators QRP Club stocks most of the more specialised parts, such as the IRF510, NE602, toroids and the variable capacitor. The large trimmer capacitor used in the receiver front-end is commonly found in old HF communications equipment. The 3.58 MHz ceramic resonator used was a blue coloured type from RS Components. Vorlac in Melbourne also stocks ceramic resonators, but they may require component value changes in the oscillator circuit to provide the correct tuning range. The author has a number of ceramic resonators available on receipt of a SASE to constructors wishing to build this or similar projects.

Operation

Using the transceiver is similar to any other rig except there is no automatic frequency offset. This means that the set needs to be adjusted to zero beat with the incoming signal every time you finish your transmission. Similarly when calling CQ, the frequency needs to be adjusted about 800 Hz to be assured of hearing any replies.

Results

Stations throughout south-east Australia have been worked with this transceiver. A number of contacts to ZL have also been made with this transceiver. One of these was with a 1.5 metre square magnetic loop antenna used indoors during a contest. All reports on the quality of the transmitted signal have been complimentary.

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Converting Computer Power Supplies

— an easy way

Keith Alder VK2AXN

THERE HAVE BEEN ARTICLES in several journals recently (1,2) describing how to convert computer switch-mode power supplies to provide 13.8 volt at up to 20 amp to power amateur equipment.

After several unsuccessful attempts to reproduce their results, including a couple of spectacular electronic disasters, I concluded that most of my problems were caused by pushing the units beyond their capacity.

Most of the readily available (and cheap) ex-computer supplies, from the 286 -386 types of computer, are rated at up to 200 watt — not a starter for the desired output. But even a 240 watt unit expired when converted to 13.8 volt and operated at 15 amp.

The conversion wasn't an easy job, requiring tracing of the control circuit and modification of the printed circuit board and the high frequency transformer. I found this difficult because none of the supplies I acquired conformed to the circuits published in the literature, particularly in the control and overload sections.

It occurred to me that a better method would be to use two power supplies suitably coupled together to provide the required output. Power handling capacity should be adequate and conversion much simpler.

So I obtained two identical 200 watt units and modified as follows:

The waveform generator in these supplies is usually a 16-pin chip, TL494 or equivalent, which produces the 30kHz (approx.) square wave drive for the chopper transistors. Pin 1 controls the waveform for regulation of the output voltage. My modification is simply to disconnect the resistor connecting pin 1 to the 5 volt output, at the 5 volt end, and connect in series a 10k trimpot. Adjustment of this enables the output voltage to be increased (in my supplies) to 7.1 volt before the supply trips.

By adjusting two such supplies each to 6.9 volt and connecting them in series it is possible to obtain 13.8 volts at (nominally!) 20 amp.

Connecting two in series requires that one supply has its earth-to-case connection disconnected. This is simple — just cut the PCB track at the one corner where it earths the supply via one of the mounting screws.

Then the two can be bolted together and connected in series. I left one cooling fan in place but reversed it to blow rather than suck; also I added an ammeter and a voltmeter at the end vacated by the second fan.

Regulation can be improved by drawing a standing current (in my case, 2 amp) through a heavy 3 ohm resistor added to each PCB but this does reduce slightly the maximum current for external load. However please note that despite the nameplate rating of the +5 volt output at 20 amp on these supplies, I do not believe they are designed for this continuously and I do not recommend trying it!

However my supply happily endures peak loads of up to 17 amps for SSB use with my TS 430S without a flicker of voltage variation, and can provide 15 amp continuously without distress.

Four further points are important: -

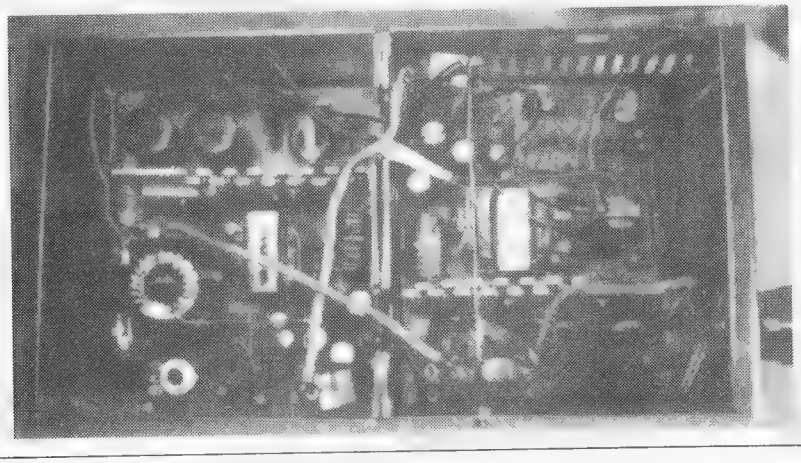
1) Pushing up the output from 5 to 6.9 volt causes the nominal +12 volt output to rise also, to about 16.5 volt. I have not bothered to change anything related to this, although it may be getting close to the limit for the 12 volt circuit filter capacitors. Nothing has gone wrong after a couple of months of daily use.

   I did not remove any components at all from the +12V, -12V, or -5V circuits because in previous tries at conversion of single units I found that some of these components were relevant to the control and overload systems and I failed miserably to trace the circuitry!

2) The increase in the +12 volt line means that the fan will run faster and be noisier. In my case I put a 25 ohm resistor in series with the fan.

3) There was some harmonic interference from the approx. 30 kHz chopper audible on 40 metres but not on higher frequency bands — I cured this by extra filtering of the output using two extra toroids (from previously destroyed units!) in series, with 0.01microfarad capacitors each side to earth.

4) MOST IMPORTANT! These supplies are probably the most lethal bit of equipment any amateur is likely to handle. Take care! Some of the PCB circuitry is at 340 volt DC with hefty capacity behind it, and is also connected directly to the mains. This applies to all of it up to and including the HF transformer. The DC output is fully isolated and quite safe. But handling the boards out on the bench is hazardous — best to make the simple modifications, re-install in the cases, and adjust with a long insulated tool.



References: -

1) Phil Harman, Radio and Communications, November & December 1998.
2) Leo Simpson, Silicon Chip, December 1998.

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Yaesu Musen FL2000B *revamped*

by N E Mattick VK2QF
"Blackwillow"
Hargraves NSW 2850

VK2QF has extended the life of his Yaesu FL 2000B Linear Amplifier with considerable ingenuity. However, constructors are warned that potentially lethal high voltages are employed in this amplifier and only experienced people should tackle this project

HAVING USED the old "FL2000B" amplifier on the ten metre band for 50Mhz dx liaison for some years in its original form until one day a heater failed and went accross to the plate inside valve 1 giving a healthy spark and "all lights out" around the place. Needless to say some sort of service was due, especially since the HT had been shorted! Replacements for the 572B's were not considered due to their prohibitive price and poor survival. So some alternatives were seriously considered.

An initial "lash up" trial of two wartime 813 Pentodes was a failure due to low gain and excess plate stray capacitance placing the plate circuit beyond resonance on the ten and fifteen metre bands, (more on this topic later).

Not perturbed by this failure I continued to concentrate on a solution that proved to be utterly successful in the end.

The parameters for the project were the following;

- Low IMD.
- Durability.
- A valve that would operate in any position.
- Low cost and recycling of otherwise discarded equipment.
- Minimal noise commensurate with adequate performance and heat removal,
- Parts must be on hand and or be made readily within a basic workshop,
- No physical changes to the appearance of the cabinet or front panel was allowed,
- High gain and equal performance across the range of bands that the amplifier was designed for, (in fact 10db of gain was realised meaning a Kenwood TS 570s as a driver will run a signal 3Db down on the legal limit Singlesideband signal),
- The basic design of cathode driven circuitry was to remain therefore any selected valve must either be a triode or more importantly be capable of triode (GROUNDED GRID CONNECTION), this was met by the chosen valve.

It is not intended to give a comprehensive description of the project as it is assumed that the builder will have sufficient experience to carry out the modifications to fruition. Furthermore this work only applies to the YAESU MUSEN FL2000B amplifier, just how this unit is different from later models eg, FL2100(B) is not known by the author, so should any builder decide

CATHODE TUNING CHART.

VSWR	INPUT INDUCTOR	INPUT C	OUTPUT C
1.4:1	Less one turn L202 = 15t > 80 mx	320 pf	150 pf
1.2:1	Less one turn L203 = 10t > 40 mx	400 pf	150 pf
1.2:1	Remove slug L204 = standard > 20 mx	250 pf	125 pf
1.2:1	Remove slug L205 = standard > 15 mx	110 pf	115 pf
1.2:1	Less one turn L206 = 4t > 10 mx	100 pf	140 pf

Note: 15 and 10 metre bands have variable capacitors to optimise loading. All fixed capacitors are SILVERED MICA types

Figure 1

TANK COIL CHART.

10 mx	4 turns from plate end
15 mx	8 turns from plate end
20 mx	12 turns from plate end
40 mx	20 turns from plate end
80 mx	29 turns from plate end

Figure 2

to modify one of these it remains their responsibility to adapt any differences in the basic design and circuit.

It is also necessary to highlight at the outset all inherent dangers when working with mains powered equipment let alone the HIGH TENSION voltages encountered in this amplifier as designed by YAESU MUSEN. This HIGH TENSION voltage is 2,400 volts which it needs to be made clear that contact with this is definitely lethal, so unless those who may attempt this work are experienced at working with these voltages it is recommended by the author that the work be done under the supervision of an experienced technician. ***It is worth noting at this juncture that the author never "powered up", "worked on" or "modified" the amplifier without its full shields and covers fitted, during each phase of development, also the mains supply wiring is controlled by an "ELCD" or earth leakage cicuit detector.***

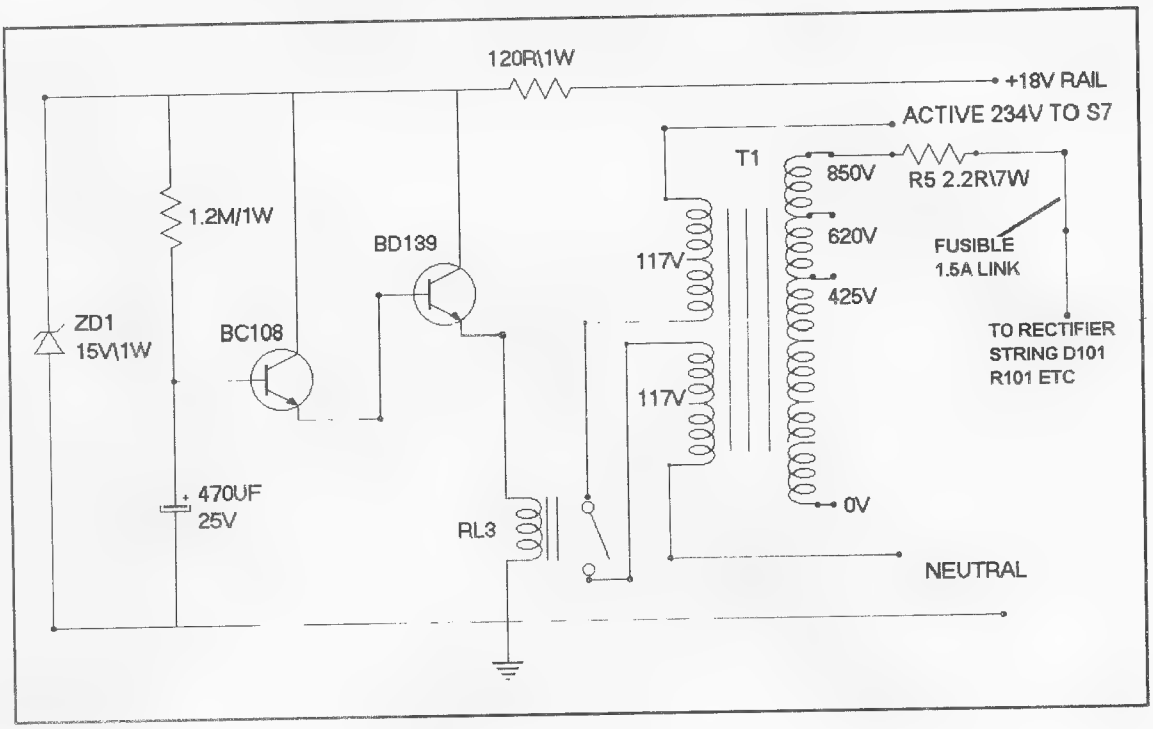

Figure 3. Timer Circuit

To modify the amplifier the constructor will need the following;

1) 8352 / 4CX1000K tetrode in known good electrical condition, these seem to sell for approximately $100 at hamfests. (It is possible that a similar result could be obtained with alternative valves, eg; 4CX1000A and 4CX1500B as they are electrically and mechanically similar).
2) Metal lathe.
3) 10 mm PTFE or perspex rod.
4) 90 mm stormwater pipe.
5) 65 mm alloy bar stock.
6) 8 x 220uF 400v or better miniature electrolytic capacitors
7) Air spaced capacitor 100pf to better than plate capacitor ratings of air gap.
8) 600pF to 1000pF 30Kv or better coupling capacitor.
9) 1 x 65ohm 20w resistor.
10) Sundry miscellaneous hardware, pcb, relays and signal components.
11) Miniature blower to deliver a minimum 40cfm of air at 13mm Hg water column.

The simplicity of the project is the relinquishment of the need for the SK820 BREECHLOCK socket. These sockets are unprocurable and cost more than the valve at retail prices. Grid grounding and mounting are accomplished in one operation with both the Screen and Control grids being clamped together in a simple alloy split ring made from bar stock.

The three rings that compose this clamp are as follows;

- Screen ring, width 3mm,
- G1\G2 ring which is a snug fit into the lands between these two sets of radial terminals,
- Base ring of 3mm which is under the G1 terminals.

These are cut in half and bolted every 120° over the valve ceramic body. A thread is cut into the top or screen alloy ring and bolts which have three simple flat mounting lugs which reach out beyond the perimeter of the 70mm diameter hole that must be made in the wall of the former Grid compartment vertical chassis. As the tolerance of the valves varies it is up to the individual constructor to ensure that sufficient clearance is provided for thermal expansion of the valve when in use, therefore as a guide the author used 0.5mm oversize for the alloy mounting rings based on the mean cylindrical measurement of the prototype 8352.

The 8352 is relocated to centralise the anode radiator in the plate compartment away from the original valve one mounting position.

The cathode compartment is largely unmodified except for;

L202 - L206 as per the chart Fig 1.

S2 is relocated away from the the terminals of the 8352.

All unused holes in the compartment are fully sealed against RF and air leaks to maximise system performance, (silicon sealant is ideal for sealing the air leaks with bolts and washers for the smaller unused chassis holes).

The L2 bifilar choke is connected by leads directly soldered to the Heater and Heater Cathode terminals of the 8352, do not omit C205 as performance will be degraded.

A new rear panel is folded to suit the blower outlet and this will be quite up to the individual circumstances to determine it's dimensions.

In the plate compartment some extensive development work must be done. To ensure adequate cooling for the 8352 and the fully mounted blower must be tested to ensure adequate back pressure drop across the plate radiator.

A simple chimney is fashioned from 90mm stormwater pipe, this product must

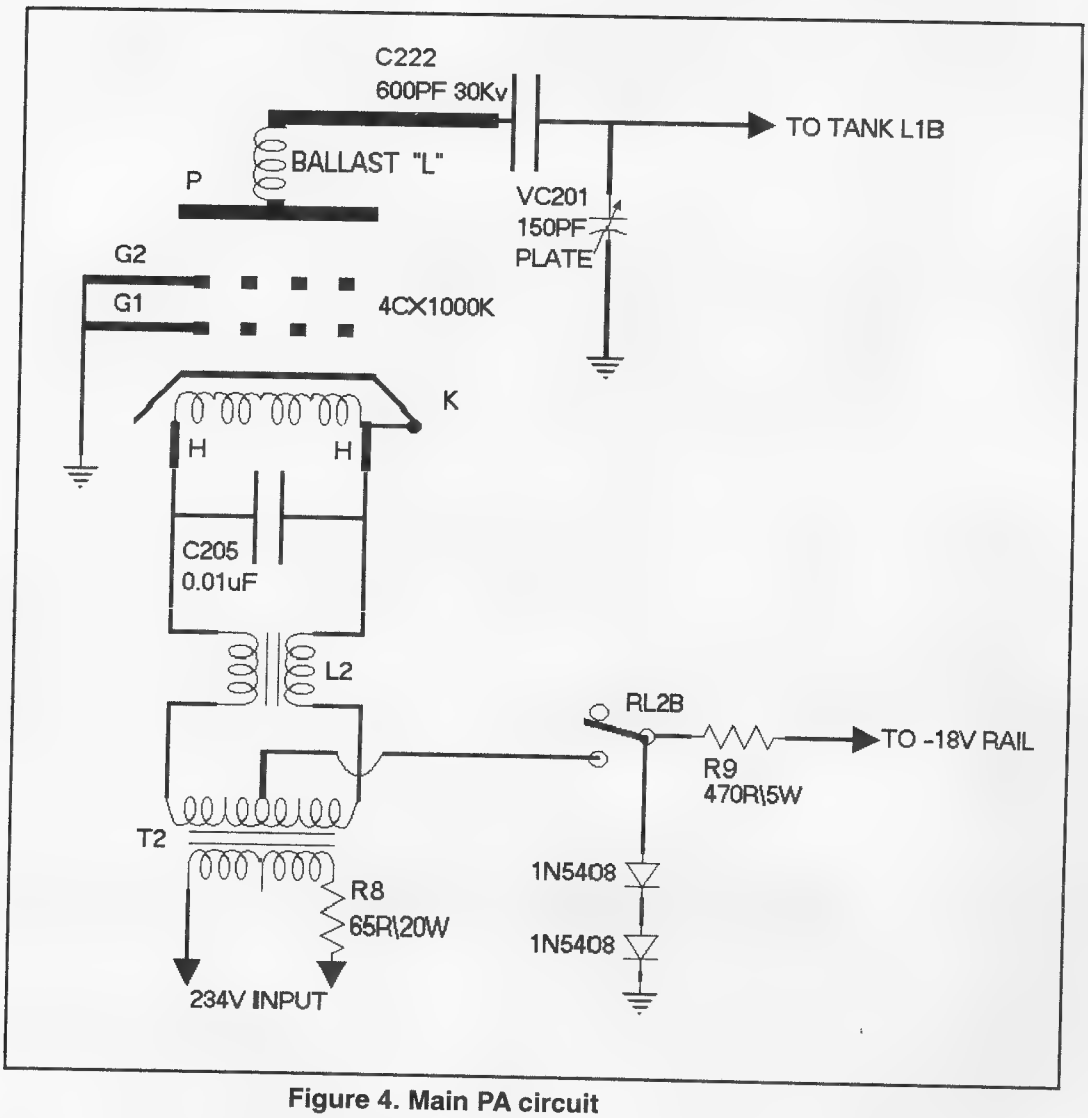

Figure 4. Main PA circuit

be given the "DIELECTRIC TEST" in the xyl's microwave oven before placing it in service. To test a sample piece of pipe place it in a microwave oven along with a suitable small dish of water to act as a dummy load, give the oven a series of short runs and test for any temperature rise in the sample. As a guide it is felt that the cream or white colour pipes give the best dielectric properties and in the authors case no heat could be detected at all with what was used as the chimney for 8352.

Once the 8352 is mounted and the chimney is fitted it is essential to assess the capacity of the blower to deliver sufficient air to cool the valve under all conditions. The miniature blower in use on the prototype is rated to deliver 100cfm into an unrestricted outlet. In practice it is delivering much less but critically it's pressure differential was measured at 13mm hg water column in the cathode compartment using a simple PVC tube sealed to the chassis. Although VARIAN specify 25cfm at 5mm water column it is safer to err on the side of oversupply.

The plate compartment is also modified ref fig 4.

L207 is repositioned and L208 / L209 are discarded. This is because the stray plate capacitance of the 8352 in this chassis situation causes the tank circuit to be beyond resonance on the upper HF bands of ten and fifteen metres. The solution to this is to place a 7 turn 20mm diameter (14 b+s wire guage) ballast inductor from plate to L207 (see fig 4 "Ballast L").

C222 is prone to failure in these amplifiers and should not be left in circuit as to do so would be dangerous, a serious replacement must be found and the author used a 600pf 30Kv coupling capacitor. A common value for these capacitors is 1000pf, this value is the original circuit design and either would be suitable provided the voltage rating is correct, around 10Kv upwards.

Other plate compartment mod's are. . .

The connecting shaft from S1 to S2 was replaced by a machined length of perspex as the original caused arcing (when the amplifier was driven) in the S1 universal coupling.

The tank coil is removed, cleaned with acetic acid (Vinegar) and re-tapped as per Fig 2.

All lines around the directional coupler are replaced with 6mm teflon coaxial cable, this will improve stability and circuit losses.

C224 usually fails in normal use and must be replaced by a 100 pf air spaced capacitor mounted in the bottom side of the plate compartment, this capacitor must be of equal or better voltage rating than that of the plate capacitor VC201. On the subject of VC201 it has a 50mm long earth strap which is a source of MF parasitics in these amplifiers so replace it with a piece of braid from the stator to the adjacent solder lug on the front panel.

On the topic of the standby condition of the amplifer it was considered important to have minimum heat dissipation around the shack. especially since this is a rather large valve in a small chassis. Unlike the original circuit the 8352 cathode is floating on receive. So the author hunted around for a design that filled the need here (ref 1). This ARRL design (a two valve passive grid 600w linear amplifier with floating cathode) was experimentally tried during run-up of the 8352 on the "bench". No problems have been encountered with this idea, measurement of the cathode voltage in standby shows 6.0v only, this is quite acceptable "self bias" and the unit does not emit any noise that will interfere with the imcoming receive signal.

The bias circuit for the amplifier has on transmit RL2B close to two 3amp (1N5408) diodes at the centre tap of the heater winding, this is biased by a 470 ohm resistor (ref fig 4 R9) from the minus 18 volt relay rail. It was found neccesary due to the high "Gm" ("Mutual transconductance") of the 8352 to "push" minus 2 volts onto the

cathode for a standing current of 50 mA via the 470 ohm resistor, bearing in mind this will vary from valve to valve also. In transmit under drive this rises to plus three volts of operational dc bias. It is in this transmit condition that another important condition must be tested in the later stage, that of the stability of the whole amplifier when all tuning controls are rotated through their ranges on all bands. No instabilities were encountered at all on any band when the unit was at transmit (no drive) drawing it's 50 mA idle current.

It is next essential to assure a 3 minute heater run up delay timer which after switch on delays by a predetermined time constant of r/c as per Fig 3 (this circuit is powered by rectifying via D1 and filtering C1 the 13 volt winding in the original heater transformer T2). This timer controls RL3 which closes the circuit of T1 to the AC supply thus enabling HIGH TENSION voltages.

With a cathode driven amplifier it is imperative that HIGH TENSION voltage is present whenever their is a possibility of drive being applied. To avoid destroying the 8352 a HIGH TENSION sensing circuit Fig 5, comprising Q1 / Q2 and RL2C which isolates the PTT line in the absence of HIGH TENSION voltage. This circuit is turned on by a 10M ohm sensing resistor from the junction of R110 and R109 in the rectifier string. Relay 2 must be a high speed type to ensure good semi-break in characteristics.

Also in Fig 5 is the DC control circuitry for the blower motor. Builders will have to adapt their own circumstances to suit in this area. The prototype blower was highly modified. Initially it's AC motor was removed and a substitute 3000 rpm high torque DC unit with bronze bearings was modified to take ball races, (most costly minor parts in the whole project!). This motor is totally shielded against noise leakage for maximum receiver performance. Power for the DC motor is via an external "shack" supply of 13.8v. It is recommended that the same supply is used to power the exciter "rig" so that as as safety measure should it fail (the 13.8v supply) the amplifier cannot be keyed. At power on, rectification of the 13v winding on T2, triggers Q5 thereby ensuring air is delivered whenever heater volts is applied. A transmit blower boost (to air supply) is via a pair of contacts in the cathode relay (RL2A), this has the benefit of low audible noise on receive and maximum air delivery during transmission periods. Blower speed on standby is controlled by RV1.

This circuit also encompasses one more essential feature for protection of the 8352 and this is an after cool rundown timer Q3 / Q4. When the amplifier is turned off after heavy work it is possible to leave the 8352

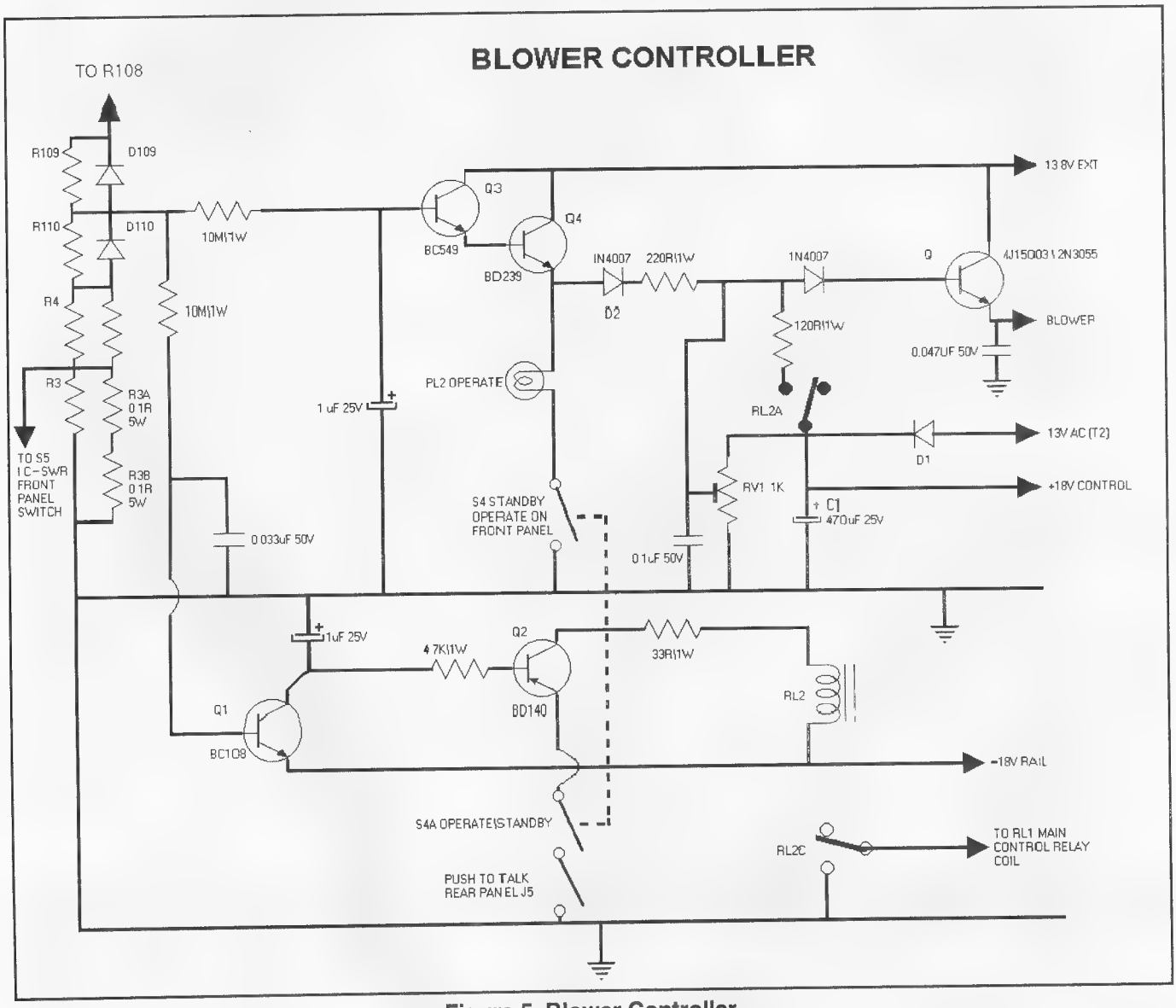

Figure 5. Blower Controller

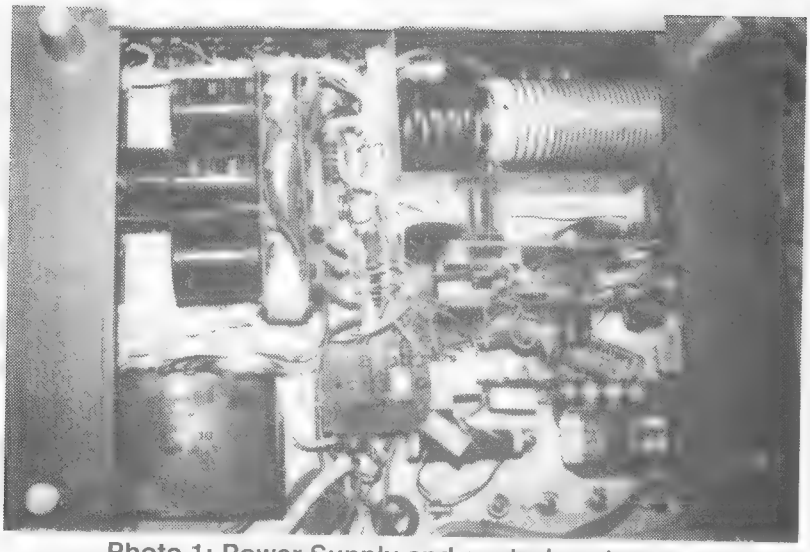

Photo 1: Power Supply and control systems

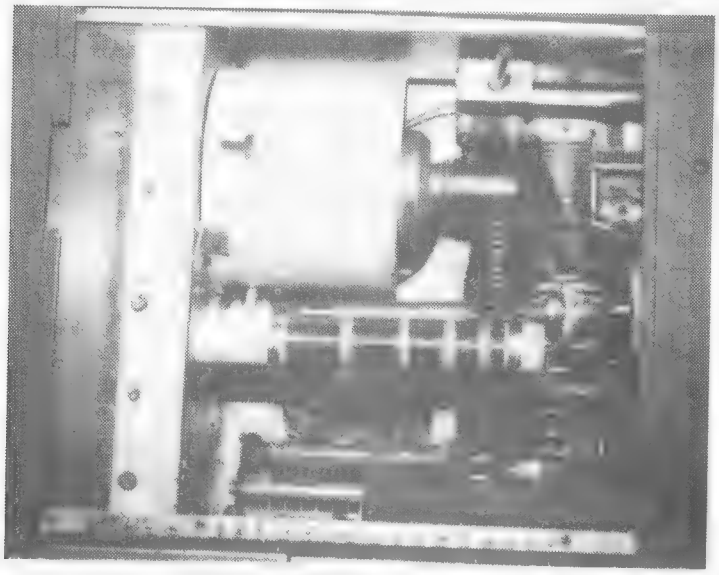

Photo 2. Output section — general layout

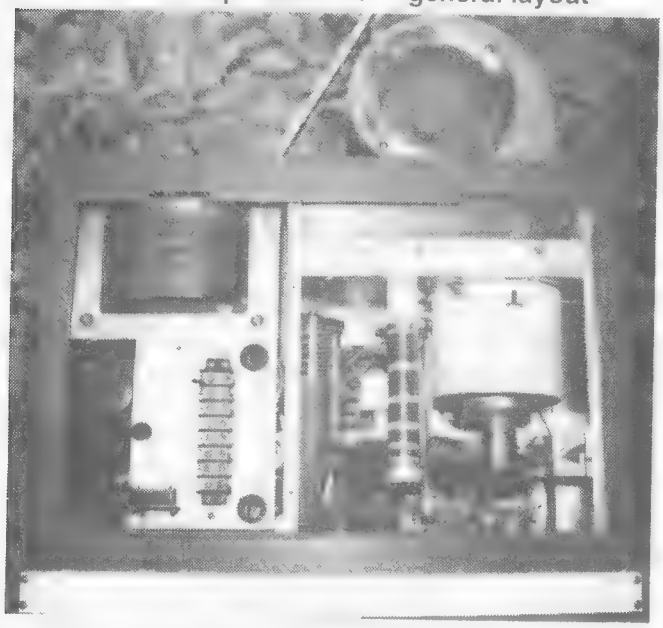

Photo 3.Amplifier — general layout (Blower)

overheated so rather than having to wait with the equipment whilst it aftercools for two minutes this is taken care of. The circuit senses HIGH TENSION voltage via a 10M ohm resistor at the cold end of the rectifier string (junction of R110 / R109) and continues powering the blower motor (via Q3, Q4, D2 and Q5) as the HT voltages bleed away.

Also in the power supply area attention must be given to the voltage doubler. The original capacitors must be replaced with suitable units to provide a total capacity of 25uF or better. By substituting 8 220uF miniature capacitors a total of 27.5uF was achieved. The need for this modification cannot be stressed too highly as performance will be severely degraded and IMD (intermodulation distortion) will increase if this area is not upgraded.

Other PSU changes are R4 the bias resistor (ref fig 5), is deleted and tapped in half to act as a surge limiting resistor. Two 0.1 ohm 5w resistors (ref fig 5 R3A & R3B) are placed in parallel with R3 thus doubling the plate meter scale to FSD of 1,200 m/A. A 2.2 ohm 7 watt surge (ref fig 3 R5) limiting resistor is placed in the T1 HIGH TENSION tapping point, this goes to a fusible link as a safety precaution.

The hazard sheet from Varian specifies a tolerance for the heater voltage of six volts +5%. To ensure that it is correct remote leads were attached to the terminals of the 8352 and with air applied, the whole system was run so that the voltage could be read. T1 / T2 (both original units) are fully tapped out in their primary circuits to the 234v position giving them the best settings to run the 8352, even so the heater voltage from T2 is in excess so a 65 ohm 20 watt resistor (ref fig 4 R8) was needed in the primary circuit to correct this critical voltage.

Tuning and Testing

Once the constructor is totally confident all the modifications are complete a small amount of drive should be applied to the circuit and the alignment process begun. Setting of the input inductors is essential, this is best done with reference to the chart of modifications in Fig 1 and the Yaesu owners manual.

As a guide peak all tuning controls and measure the reflected power in the exciter line. Assess the necessary changes to be made either to the appropriate inductor or capacitors that are modified in the input circuit.

Since developing the amplifier it has had many hours of "ON AIR" use, mainly for semi break-in CW contesting where it has performed faultlessly. Whilst no "Lab'" attempt has been made to assess the IMD

performance of the 8352 it appears using the equipment available that it is either the same to better than original.

One more point to bear in mind is that this amplifier had in it's original condition the ability to exceed the legal power limit for the Amateur service in Australia. The "revamp" described in this article also has the potential to exceed the power limit and constructors must ensure that the Regulations are complied with.

So there it is a faulty piece of equipment returned to vastly better use, now is the time to rebuild whilst the "SOLAR WINTER" is on and be prepared for bigger and better "DX" in cycle 23.

References

1: ARRL handbook for 1976, page 184 "A 160 Meter Amplifier".

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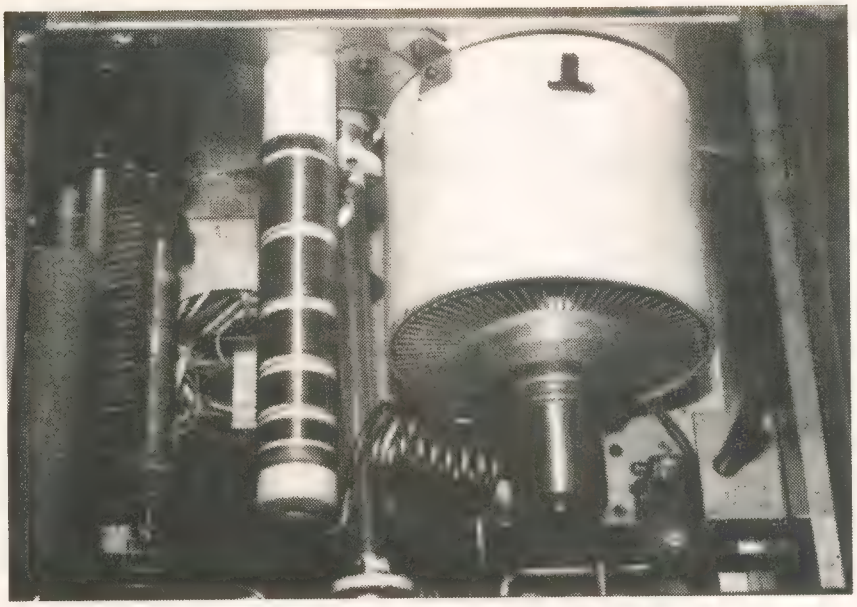

Photo 4. Output stage — tube detail

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CLUB NEWS

The Central Coast Field Day

– the biggest Amateur Radio event in the Southern Hemisphere

The Central Coast Amateur Radio Club will again be holding Australia's largest amateur radio event **The CENTRAL COAST FIELD DAY** on **Sunday 27 February 2000 at the WYONG RACECOURSE, Howarth St, Wyong.** Gates will open at 8.30 am in wet or fine weather and displays are under cover. This is one of the longest running events in the Australian amateur radio calendar and the year 2000 field day will be the 43rd consecutive year of this popular and growing event.

As usual a large contingent of well-known suppliers of electronic equipment, components and books will be attending. These companies will have their latest products on display and many traders will have items on sale at very special Field Day prices.

The ever popular "**Flea Market**" attracts a large number of people who trade an enormous amount of surplus electronic equipment to eager buyers from trestles, their trucks, trailers or from the boot of their car. The flea market just gets bigger every year.

The organisers are keeping the format for the Field Day in line with the changing face of amateur radio. In recent years seminars on a wide range of topical subjects ranging from packet radio to satellite communications have been a popular attraction. This year an even bigger program of interesting lectures and equipment displays is being been arranged.

FIELD DAY ATTRACTIONS WILL INCLUDE ...

- ALARA Stand, Flea Market
- Disposals, Various Amateur Television Groups
- WIA Historian Stand, Packet Radio Displays
- QSL Bureau, Fox Hunts
- Seminars, Technical Lectures and Workshops, Historical radio displays
- VK2 Education Service Stand, WICEN Display
- Trade Displays and Sales, Satellite Television Receiving demos.
- Complimentary Reptile Park Tickets for the family,

ADMISSION ... Adults $10.00 ... Children under 12 Free ... Seniors Card $5.00 ... Pensioner $5.00 ... Students $5.00.

A special group concession is available on application.

Trading and all programmed activities will commence at 8.30 am.

INFORMATION ... On the **Wyong Racecourse** venue, Group Concessions, Trade Displays, Flea Market,

Disposals, Programs or any other Field Day information can be obtained by writing to:

CCARC Field Day Organising Team

PO Box 346, Woy Woy, 2256 NSW Phone 02 4340 2500

Packet: VK2AFY@VK2EHQ, email: bobfitz@ozemail.com.au, Home Page http://www.ccarc.org.au/

Further information is available on the Field Day section of our club's web site www.ccarc.org.au or by phoning me on 02 4389 9206.

Companies, persons, groups or clubs wishing to set up a traders table or display at the Field Day should contact the Field Day Organising Team before 31st January, 2000.

Bob Fitzgerald, VK2XRF

Adelaide Hills Amateur Radio Society Notes

AHARS has just held it's annual Buy and Sell. It was possibly more successful than last year as the dates of the Classic Adelaide Car Rally were avoided. Last year so many of the AHARS members were assisting with radio communication for the Rally that attendance at the Buy and Sell was down.

As a fore-runner to the Buy and Sell the ESC (Equipment Supply Committee) were invited to address the November meeting . This was a very interesting and informative meeting and certainly will have increased sales of parts and kits on the day as well as made members aware of the range of kits and interests the ESC carries.

We were also interested to hear how many changes in emphasis there have been over the years. ESC was formed almost 40 years ago when there were still many components and complete units available as surplus form the war years. David VK5KK very clearly knew his stock and the history of the group through those years

Then, valves and valve value components made up the bulk of the parts held by the ESC, now it is ICs and other small items that fill the drawers.

A catalogue of some of the kits and components available are published from time to time but the ESC is also always available directly through P.O. Box 789 Salisbury. 5108 SA. Please allow a little time for processing.

Redcliffe Radio and Communications Group Course

The U3A Redcliffe Radio and Communications group is now taking enrolments for the year 2000 AOCP Radio Course which commences on Tuesday February 1.

This is a very popular course among retirees and shift workers as the classes are held on Tuesday mornings from 10.00am till 12 noon with some weekends. Numbers are limited to twelve, plus correspondence students.

The course gives full coverage that includes workshop and "on air" practice, technical theory, morse code (not compulsory) and regulations at AOCP level, and finishes up in November with the examinations.

There are no class fees except the U3A registration which is very reasonable. A recommended textbooks list is available with syllabus.

Further information and course syllabus can be obtained by contacting Kevin VK4AKi on 07 3880 1112 or
url: http://www.qsl.net/vk4aki

ALARA
Christine Taylor VK5CTY
ALARA Publicity Officer
16 Fairmont Avenue, Black Forest SA 5035
Packet: VK5CTY@VK5TTY

"DX before dishes" in 2000

The ALARA Contest

This was not quite as successful as we would like either because propagation just didn't seem to be in our favour or too many people had other things to do that day. Fewer contacts than usual seem to be made during the day, perhaps because the date clashed with other commitments. On 80 metres, though, a lot of callsigns were heard.

Some overseas YLs and OMs contacts were heard and a few more people around the World have now heard of ALARA and understand what the letters stand for. That is a positive outcome for us all.

Anyway, we hope you enjoyed the contacts you did have and hopefully you have all sent in your logs or the Contest manager will be very cross!!.

Don't forget, you can claim for the ALARA Award if you used the contest to accumulate the required YL stations. The details of this award are listed in the November issue. Do give the Awards Manager some work to do, she claims that she needs it.

The Masters' Games

As we told you a few months ago Maria VK5BMT offered her services as a volunteer for the Masters' Games held this time in Adelaide.

Guess where she was used? Yes, they put her in the central radio room where she was delighted to be able to use her special skills. She was the distribution point for all the information from and to all the venues.
She kept track of where people were and was able to save a few headaches because she actually knew when some one was unavailable or perhaps was on their way to a different venue.

All the changes, all the results and all the requests came though Maria's ears and hands.

William , the man in charge, said he had never had such an efficient radio operator. As William has been in charge of the overall operation of the last two Masters' Games, that is high praise.

Well done Maria for showing 'outsiders' one of the faces of amateur radio.

Incidentally, Maria says she enjoyed every minute of it and would do it again tomorrow.

The New Century

Well, how did you fair with Y2K? How many New Years' resolutions did you make — and how many have you already broken?

I hope one of the resolutions was "DX before dishes" The sunspot cycle is at it's peak this year so let us all make the most of it.

One group that is planning to make the most of the sunspots is the YL International SSB'ers, Inc . They are calling for a one month reunion (particularly of those who are 'Old Timers' with membership numbers below 10,000) during the month of February on 14.332mhz.

They are calling the event "'YL' 2K Homecoming".

Why not participate? It sounds most interesting.

This information was sent to me by Dave VK1GD but originated from Dick KA3DCQ who had the idea of a 'Homecoming' to celebrate the high sunspot number year, in 1992. That effort was very successful. Hopefully this one will be equally successfully. Why not give it a go?

There is a website maintained by Jim VE1JIM at http:\\www.qsl.net/yl-issb.

This group has a VK-ZL group with Dave ZL1AMN as control. It is around 02.30 Zulu each Saturday that you are likely to hear Dave and others. Other times, other areas are accessed. For this information why not try the website listed above or contact Dick himself on ka3cdq@chesapeake.net or Rhonda at hamsrus@afcon.net

Flo Reitzel KU7F is the usual YL control in the US.

As is the usual arrangement, new members are sponsored by existing members e.g. June VK4SJ and her OM were sponsored by Larry W5VTM.

Once a year a large (140 page) Newsletter called "The Voice" is sent to members with smaller ones monthly. An annual QSO party is held and a number of local dinner gatherings. The group also fund a $500 scholarship each year.

The motto of the group is "We believe in the dignity of Man" and their aim is to "Build Friendships among all the People of the World and to the Service to our Fellowman, wherever they may be through Amateur Radio"

If you are a SSB DXer YL or OM you could be interested to participate. If you are not interested yourself you might like to pass the information on to others to help to swell the numbers.

Ahars Buy and Sell

As usual the VK5 YLs provided food and drink for the annual talkfest that is officially the AHARS Buy and Sell event. This is definitely the place to meet other amateurs either for the first time or because you usually do meet them each year as you wander among the stalls looking for "just the thing".

As we all know, one person's junk is another's treasure. A few items do reappear on a different table the next year, but most are put to good use by the new owner.

Jean VK5TSX and Tina VK5TMC were the organisers this year but they were helped on the day by Meg VK5YG, Jenny VK5ANW, Marilyn VK3DMS and Christine VK5CTY.

Photographs of Brisbane were on show and souvenirs were for sale.

Action for the month

Tell a non-member what the WIA does for all amateurs in Australia

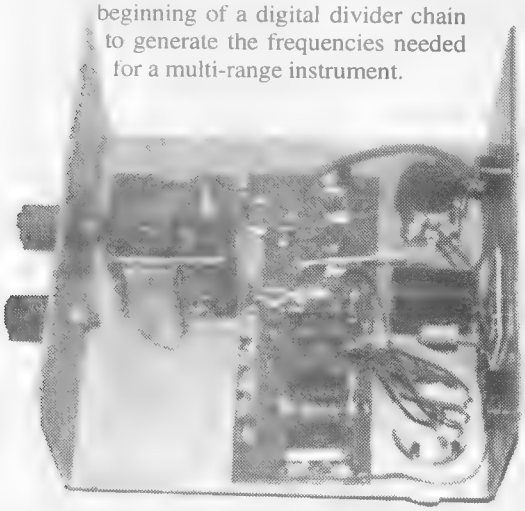
Yet another **Inductance Meter!**

John Hassell VK6JAH

THE DESCRIPTION OF an RF inductance meter by Lloyd Butler in the June 1997 edition of AR convinced me I needed something similar to sort out the collection of RF chokes and coils I have gathered together over the years.

Lloyd's inductance meter covers 0.1uH to 3mH in four ranges using a switched RF oscillator to excite a tuned circuit made up of the unknown inductor and a calibrated variable capacitor . RF current in the tuned circuit is detected and measured by a rectifier and meter. The variable capacitor is calibrated in inductance so that when resonance is indicated by the meter the value of the unknown inductor can be read from the capacitor's dial.

The main problem encountered by Lloyd was to make the oscillator work on four widely different frequencies. His final design uses some rather complicated switching to achieve a result and I wondered if a single frequency oscillator with a digital divider would be simpler and easier to get going. The other difficulty I saw was finding a 50uA meter for the detector circuit. These are now rare on the surplus market and expensive if purchased new. In AR for May 1997, Drew Diamond described his "Nano-L" inductance bridge. He used a transistor and LED combination as the resonance indicator and this looks a cheap and simple substitute for a meter. He also used a TTL crystal oscillator module as his RF source which would be the ideal beginning of a digital divider chain to generate the frequencies needed for a multi-range instrument.



Circuit Details

I followed Lloyd Butler's idea of a switched range oscillator but used TTL logic to generate the required frequencies. I start with a 16 MHz oscillator module, then divide the signal down with a 74161 binary divider which gives outputs on 8 MHz, 4 MHz, 2 MHz and 1 MHz. Two further divisions are made using a 7474 dual D flip-flop to give outputs on 500 kHz and 250 kHz. Not all these frequencies may be needed as it will depend if the tuning range of the variable capacitor used gives excessive overlap of the dial scales, in which case some frequencies may be omitted during calibration.

Rotary switch S1 selects the wanted frequency and feeds it via a 0.1uF capacitor to the 20k drive potentiometer. This switch is a single pole 12 position type with an adjustable index ring which allows the desired number of positions to be set. I set the switch initially to 7 positions to select all the frequencies from 16 MHz to 250 kHz. If some frequencies are not needed it is easy to reset the index ring later. The 2.2k pull up resistor ensures the TTL output swings almost to the +5V rail.

The 20K drive potentiometer sets the level of signal to the tuned circuit formed by the variable capacitor and the unknown inductance. The tuning capacitor I used is a dual 400pF per section type wired in parallel to give a capacitance range of about 30-800 pF. The two 33pF capacitors coupling the signal into and out of the tuned circuit are a compromise. If they are made smaller in value they block too much signal on the lower frequency ranges, if they are too large they load down the tuned circuit at higher frequencies.

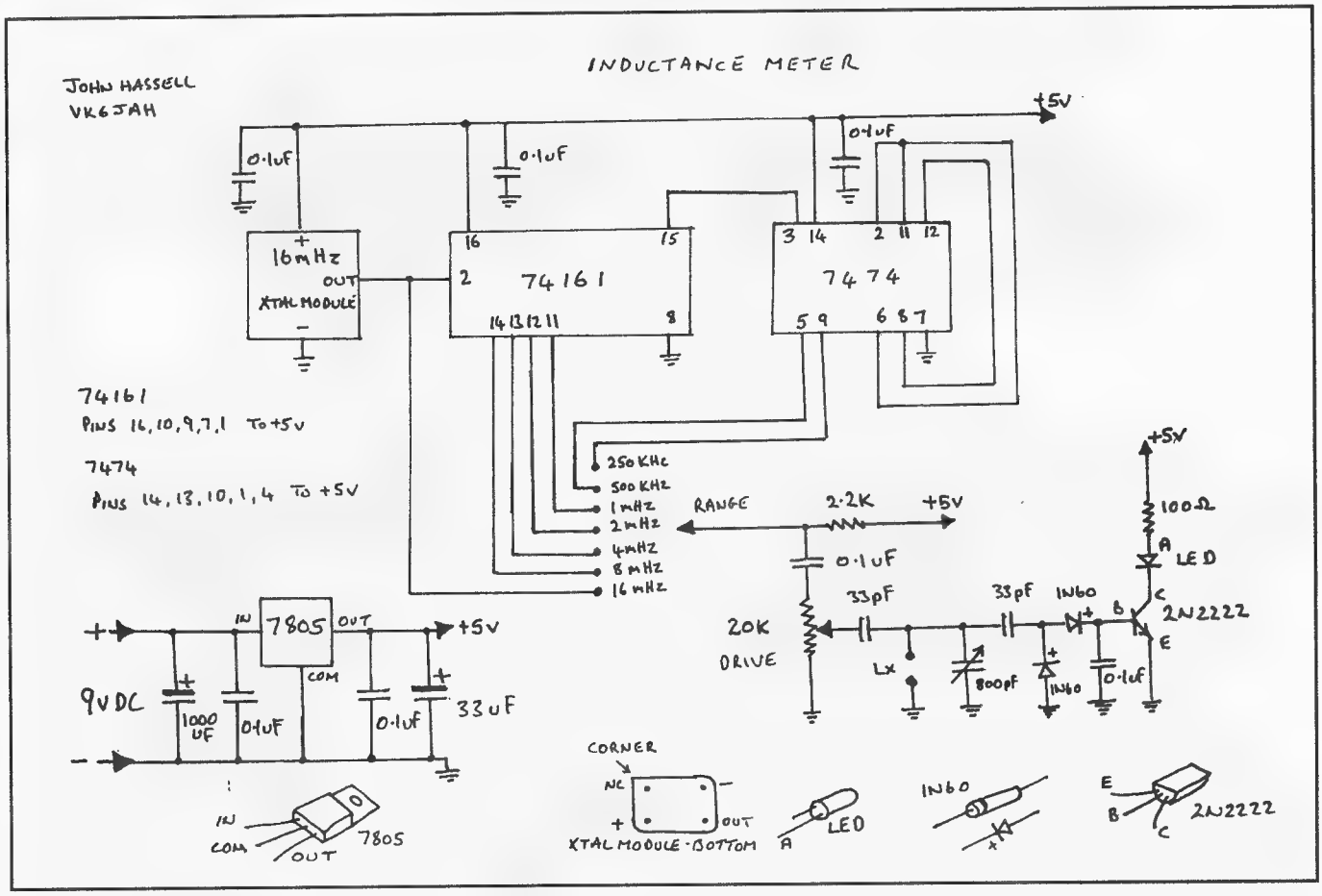
The detector and LED indicator circuit is straight from Drew Diamond's "Nano-L" design and works very well. At resonance, peak RF voltage is developed across the tuned circuit. This is rectified by the detector diodes which provide bias current to turn on the transistor and light the LED. Be sure to use germanium diodes in the detector as silicon diodes have too much forward voltage drop. I used 1N60 diodes but 0A91 or 0A95 types are also suitable. Any small signal npn transistor can be used to drive the LED. I had a 2N2222 on hand but a BC109 or 2N3904 works just as well.

Power requirements for the inductance meter is 5 volt at about 130 millliamp using standard TTL. I powered my unit from a 9V 150 mA DC plug pack and used a 7805 regulator to give the required 5 volts. Battery power could be used but it would be a good idea to go for LS series TTL to lower current demand. A 78L05 100mA regulator would then be adequate.

Construction

The inductance meter was built into a home-made 140mm x 140mm x 70mm aluminium box. The box is made by bending up two U shaped pieces of aluminium so that one piece forms the base and two sides and the other piece the top and the two other sides. The two parts of the box are held together with small pieces of aluminium angle and self-tapping screws. All the major component parts are mounted on the under-surface of the top part of the box.

The circuit was constructed "Paddy Board" style on a 110mm x 40mm strip of copper-clad board which was glued into position. I mounted the integrated circuits on small substrate boards glued to the main board but "dead bug" style mounting would work just as well. The 7805 regulator with its associated filter capacitors was mounted on a small separate board.This board was glued to the side of the box and the tab of the 7805 bolted to the aluminium for heat sinking. I used a dab of glue from a hot glue gun to hold down the main board and the solder pads. This allows minor adjustments of pad position to be made with the touch of



a hot soldering iron and easy removal of the pad if there is a change in design.

Mount the tuning capacitor so that the solder lugs for the fixed plates are as close as possible to the "hot" terminal for the unknown inductor. I used two solder lugs on the "hot" terminal and soldered them to each of the fixed plate lugs on the dual gang capacitor making a very short parallel connection. The "cold" terminal is bolted directly to the aluminium box side. A 50mm cursor was cut from a scrap of thin perspex and glued to the knob mounted on the capacitor shaft.

Make sure when you position the potentiometer, LED indicator and rotary switch, that you leave room for the swing of the cursor.

Wiring should be kept short and direct and the 0.1uF by-pass capacitor on each integrated circuit's +5v line should be soldered directly between the pin and earth. Remember that with TTL all unused control and input pins must go somewhere usually to +5v. The load input pins 3-6 on the 74161 can be left floating.

Operation and Calibration

With an unknown inductor connected, select a range and set the dial so that the variable capacitor is at minimum mesh. Set the drive potentiometer so that the LED is just extinguished. Swing the dial and watch the LED for a "blink". If there is no indication of resonance, select another range and try again. When an indication is seen, back off the drive a little and try to find the peak brightness of the LED by rocking the dial back and forth and then read off the inductance value from the dial scale. Always try to use the minimum amount of drive as this will give the sharpest indication and suppress any spurious resonances.

I calibrated the unit using known inductors that I had on hand. The large electronic parts retailers such as DSE and Jaycar sell RF chokes in a range from 1uH through to 10mH for around $1 each, so it is not expensive to purchase a selection to provide calibration points for each range. Remember that inductors can be connected in series and parallel in the same way as resistors to give other values.

I drew up a paper scale and glued it in position. Initially mark the inductance values on the scale in pencil so that any mistakes can be easily corrected, then ink them in later. A coat of clear varnish makes the scale more durable, just check it does not dissolve the ink!

Parts

The variable capacitor I used came from an older style transistor radio and is the metal framed type. Avoid the plastic ones. The crystal oscillator module came from Vorlac Industries and cost 50 cent. Check their web page for this and lots of other interesting surplus bargains.(www.vorlac.com.au). Remember it does not have to be exactly 16MHz. Anything around that frequency will be fine. All other parts are available from the usual electronic suppliers.

Final Thoughts

Here is a simple inductance meter which is cheap, easy to build and easy to get going. Being crystal controlled the calibration should be very stable. The only part that may be hard to find is a suitable tuning capacitor. Check out the local garage sales for old transistor radios. Dead ones go very cheap!

References

1. An RF Inductance Meter - Butler, Amateur Radio June 1997
2. Nano-L Inductance Bridge for Small Coils - Diamond, Amateur Radio May 1997
3. TTL Cookbook - Lancaster, Howard W Sams & Co. 1975

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An Experimenter's power supply with Current-Limit

Drew Diamond, VK3XU
45 Gatters Rd
Wonga Park 3115.

Regulated, variable voltage power supplies find use in all aspects of radio and electronics work- and there never seems to be enough of them. It is some years since we offered plans for a bench power supply for the experimenter (see Ref. 1). That model was fitted with just one current limit of nominally 2 A. But there are times, especially during development or troubleshooting, when, in order to reduce the likelihood of damage, a limit on the current capacity is very desirable. Current- limit/constant-current mode is also a handy feature when charging Ni-Cd and small lead-acid batteries.

POWER SUPPLIES which offer continuously variable current-limit appear in electronics journals from time to time. However, that feature perforce makes the design rather complex. The circuit is considerably simplified if switched, rather than continuously variable current-limit suits the intended applications.

Typical electronics and radio projects generally require a supply of 6, 9, 12 or 15 Vdc at up to perhaps 1 A, so it may be (fairly safely) assumed that a maximum of 1 A would suit most experimental work, and that a voltage range of 3 to 20 V would power the greater portion of contemporary electronic devices. Hence the range provided for this model, which has the following measured characteristics:

Performance

Voltage Range: 3 to 20 Vdc.

Current Range: 100 mA, 500 mA and 1A.

Load Regulation: Within +/-10 mV from no-load to rated load.

Line Regulation: Within +/-5 mV for +/- 10 % change in mains.

Ripple and Noise: Less than 10 mV p-p at full load.

Output Protection: Short-circuit and limited reverse polarity.

Circuit

The circuit is quite conventional, and employs the popular, and readily available LM723 as regulator. The internally generated 7.2 V reference at pin 6 is dropped to 2.3 V, and applied to the error amp. non-inverting input at pin 5, thus setting the minimum voltage output at about 2.8 V (it cannot be made to go to zero without a considerable amount of extra circuitry). Error signal, from the voltage divider comprised of 560 ohm - 5 K pot - 680 ohm sensing resistors connected between (+) and (-) output terminals (or "binding-posts") is applied to the inverting input at pin 4. As the '723 can only supply 100 mA on its own, the output current at pin 10 drives a 2N3055 power transistor as series pass regulator.

The voltage applied between pins 2 and 3 controls the current availability. When the positive voltage at pin 2 (with respect to pin 3) approaches 0.54, the supply will go into constant-current mode, thus limiting the current to that value. Current sampling is obtained from a series string of low value resistors of 0.55 - 0.55 - 4.7 ohms. Switch S1 is wired so that current limits of 100 mA, 500 mA and 1 A may be selected. If a short-circuit load is accidentally applied, no damage is done, because the supply will instantly go into constant-current mode at the set limit.

Transformer secondary voltage is 22 Vac each side of centre tap which, after full-wave two-diode rectification and smoothing provides an un-regulated voltage of about 31 Vdc. A 1 K bleed resistor is connected across the 4700 uF smoothing capacitor in order to discharge the capacitor when mains is removed.

High frequency stability is obtained by inclusion of a 470 pF capacitor between pin 4 and HF comp. pin 13. Stability is further improved with the addition of a 47 uF capacitor connected between (+) and (-) output terminals. The '723 is reportedly prone to malfunction when transmitting near, or from a '723 type supply. Connection of 100 nF ceramic or monolithic capacitors from each output terminal to chassis, and another between, and right at the terminals effectively prevents RF signals from entering the regulator input.

When using such a supply, for all kinds of jobs, there is the possibility of wrong polarity being accidentally applied (when battery charging for instance). A 6 Amp diode is reverse connected across the output terminals to absorb energy from inductive loads which may "kick-back" a reverse potential, and to provide protection from wrong polarity. Should a strong source (a set of charged Ni-Cd's for example) remain wrongly connected for more than a few seconds, the diode will overheat, and short-circuit the output- the only damage being the destruction of an easily replaced diode as a slap on the wrist for being so careless. A 3 Amp diode is connected in series with the (+) lead in order to prevent external voltage sources from reaching the regulator should mains supply be removed.

Construction

Because of their great utility, power supplies can get rather knocked about in service, so a fairly solid metal cabinet is suggested. A metal box will also provide added immunity

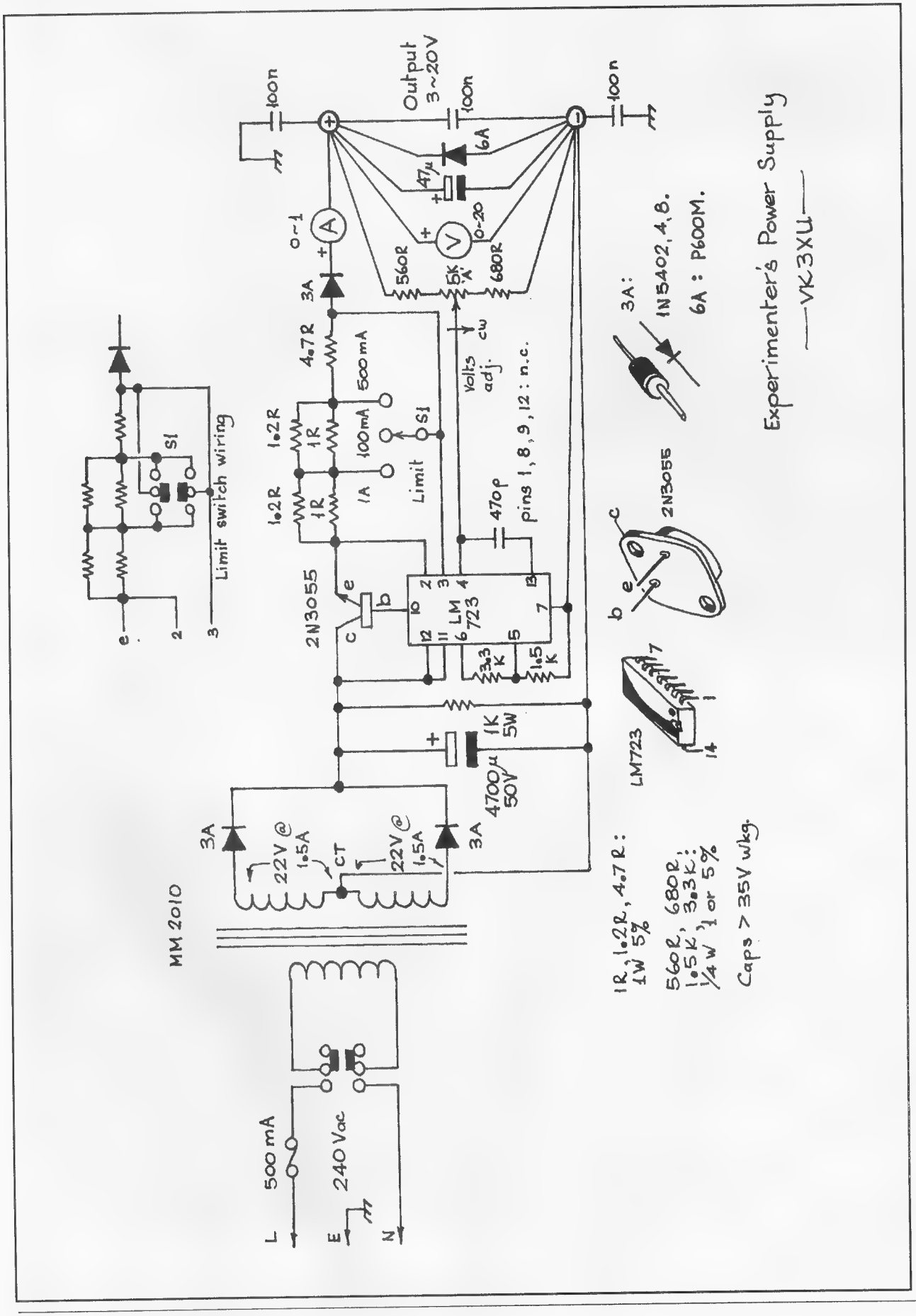
Experimenter's Power Supply
—VK3XU—
Output 3~20V
100n
6A
47µ
0~20
0~1
560R
5K 'A'
680R
3A
4.7R
500 mA
100 mA
1A
S1
Limit
Volts adj. cw
470p
pins 1, 8, 9, 12 : n.c.
1.2R
1R
2N3055
LM 723
3.3 K
1.5 K
1K 5W
4700µ 50V
22V @ 1.5A
CT
MM 2010
500 mA
240 Vac
L
E
N
Limit switch wiring
3A: 1N5402, 4, 8.
6A : P600M.
2N3055
LM723
1R, 1.2R, 4.7R: 1W 5%
560R, 680R, 1.5K, 3.3K: ¼W 1 or 5%
Caps > 35V wkg.

Figure 1

Photo 1. Experimenter's Power Supply

from RF fields. The home-made aluminium enclosure shown in Photo 1 measures 150 x 150 x 180 mm WDH. Photo 2 shows a suggested chassis and panel arrangement. Chassis and cover are 1.5 mm sheet, and front and back panels are 4 mm sheet (check out the "off-cuts" bin at you local al. merchant). Any box that you prefer, squat or tall, will serve.

In order to dissipate excess heat generated by the 2N3055 under some load conditions (the worst normal load is 3 V at 1 A, the worst abnormal load is a prolonged short-circuit), the 2N3055 must be fitted to a 2 degree C/ W (or better) heatsink which in turn is mounted upon the rear panel. Mine uses a Jaycar HH8566. A Dick Smith H 3485 would also serve. After drilling the holes for the '3055, countersink each hole a little to remove burrs. Include a silicon-impregnated TO3 washer and bushes when installing the '3055.

During development of this supply, my experimental "lash-up" consisted of the individual parts wired up on the bench, with components tacked-on as required, and the circuit worked properly like that; so it may reasonably be assumed that just about any wiring method that you prefer will work satisfactorily. Photo 3 shows my own preferred approach to building one-off projects, which uses "paddyboards" (see Ref . 2) upon a main board measuring 100 x 70 mm. The '723 is accommodated in a 14-pin machine I.C. socket. Each of the 14 pins has a 20 mm 0.6 mm dia. (approximately) tinned wire soldered to it, which in turn are soldered to each of the 14 lands of a substrate measuring 35 x 25 mm . Or a Dick Smith H-5600 or 5601 PCB, fitted with a 14-pin socket would also serve. The I.C. substrate is soldered or super-glued copper side up upon the main board.

The output should "float". That is, neither (+) or (-) rail should be connected to chassis. This dodge helps to reduce hum loops in audio work, prevents polarity problems when connecting to other equipment, and allows other supplies to be connected in series with this one to obtain higher voltages when needed. Therefore, the circuit board and all other parts must be effectively insulated from chassis using insulated spacers and/or washers. Check with your multimeter from time to time during assembly that no "stray" grounds have occurred-especially after fitting the '3055.

To obtain good voltage regulation, the sense resistors should connect right at the output terminals, as shown on the circuit. There are rather a lot of connections to these terminals, so it would be prudent to forget about ordinary solder tags, and make up extra large tags from brass sheet, or use a 65 x 15 mm piece of circuit board, divided with a hack-saw cut, and fitted under the terminal nuts, as shown in Photo 3.

The current-limit switch S1 is a miniature toggle DPDT "centre-off" type. To reduce contact resistance, the contacts should be wired in parallel, as depicted on the circuit. All mains connections must be adequately covered, using heat-shrink tube or similar, to prevent accidental contact. Rather than use components which are "adequate", I have "over-specified" on the transformer (1.5A instead of 1 A), diodes and two or three of the other parts. The small additional cost is justified in terms of significantly improved reliability. If a front panel "on" indicator is required, wire an LED in series with a 4.7 K 1/2 or 1 W resistor across the 4700 uF cap. The short lead of the LED connects to the (-) rail.

Operation

Visually check all wiring connections and component polarities. Test for very high resistance for each output terminal to chassis to confirm that no stray grounds have occurred. Remove the '723 from its socket. Switch on, and measure the dc voltage across the 4700 uF capacitor, which should be about 31 V. Switch off, wait for the cap. to discharge, then install the '723 and switch on again. It should be possible to smoothly adjust the output from about 2.8 to 20 or 21 V.

Obtain a range of wire-wound resistors and check that the current-limit works properly. For instance, at 10 V, a 10 ohm resistor will draw 1 A. If you try to output a higher voltage, the voltmeter should remain at 10 V and the ammeter at 1 A (or perhaps just a little more for both). Similar for the 100 mA (100 ohms) and 500 mA (20 ohms). Test the full regulated capacity by connecting 20 ohms at 20 V; the supply

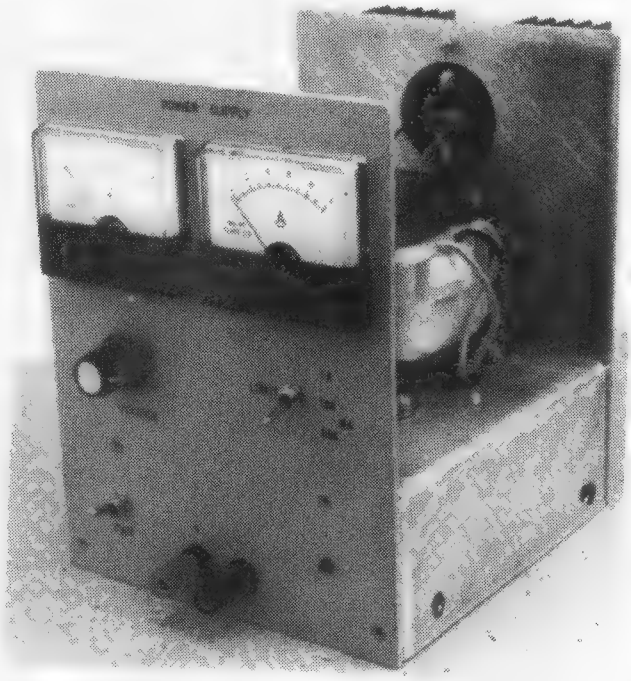

Photo 2. Chassis and heatsink

should deliver 1 A with no perceptible fall in voltage. With the current-limit proven, test the short-circuit protection, if desired, by bridging the output terminals.

When battery charging, set the current limit to the nearest recommended rating. If in doubt, a general "rule of thumb" for Ni-Cd's is about 1/10th the Ah capacity of the battery. Adjust the supply 2 or 3 V higher than the nominal battery voltage (say 9 V for a 7.2 V battery). Connection of (+) to (+), (-) to (-) will cause the supply voltmeter to indicate the actual battery voltage, and the ammeter will show the constant charging current. As the battery charges, the voltage should gradually rise to a value slightly higher than the nominal battery voltage.

Parts

The transformer in the prototype is a type JT180, Cat. MM-2010 from Jaycar. If you choose a tapped 30 V/ 2 A transformer, use the 24 V tap and a full-wave bridge rectifier. 1 W carbon, and 5 W wire resistors may be ordered from Altronics and Jaycar. All the remaining components are available from the usual electronics merchants, such as Altronics, Dick Smiths, Electronics World and Jaycar.

References and Further Reading:

1. "HFC Regulated Variable Voltage Power Supply"; Diamond, AR May '93.
2. ""Paddyboard" Circuit Construction"; Diamond, AR, Feb. '95.
3. The Art of Electronics, 2nd Edition ; Horowitz & Hill, Cambridge University Press
   (see Ch 6 for an excellent theory and prac. essay on power supply design).

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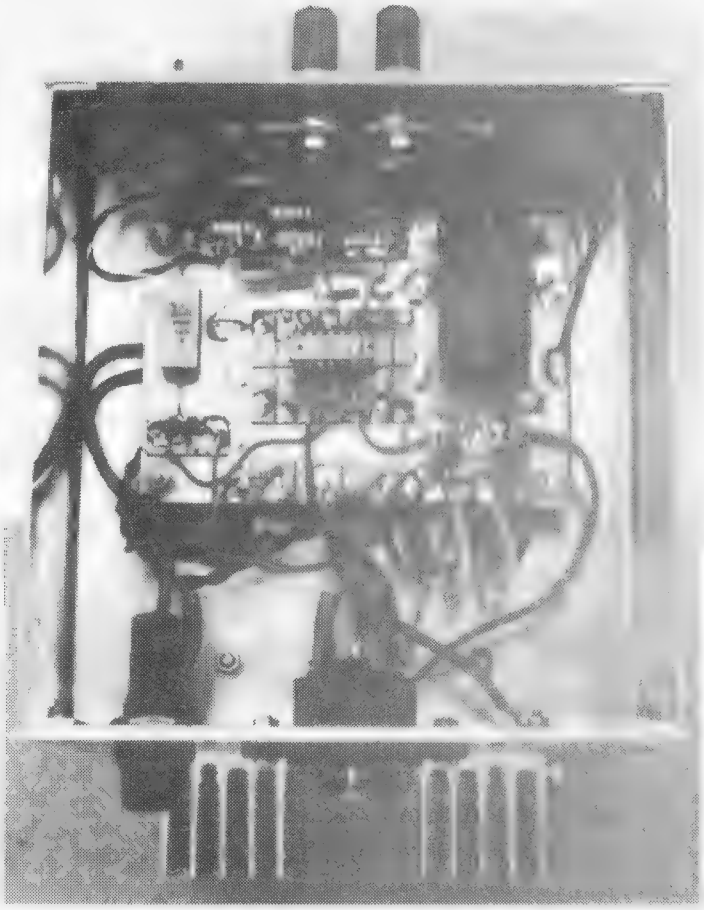


Photo 3. Under Chassis view

Book Review

Pioneers of Radar, by Colin Latham and Anne Stubbs
Sutton Publishing 1999, ISBN 0-7509-2120-X

More than an exercise in nostalgia

by Ben Furby VK2XNZ

THE TIME: 1935 to 1945. Situation: Radar is vital to Britain's war effort against the Germans, who from September 1939 have been dropping magnetic mines and later bombs on Britain. Physics graduates, machinists, stores experts and others have been hastily assembled to get radar equipment out of laboratories and into field service, at ground stations, aircraft and ships.

This book, a 263 page collection of the varied-length reminiscences of 59 contributors, is more than an exercise in nostalgia. Many of these contributors became famous in electronics engineering and science then, and later. They are not all scientists, but include machinists, photographers and stores people. Among a scattering of Australasians gathered by the brains search net was Professor (later Sir) Mark Oliphant at Birmingham, who led the team that evolved the magnetron, the key to powerful, UHF radars.

Plenty of amusing incidents ensure this book is not a dreary catalogue of individual experiences. These often related to pressure and speed to get equipment up and running yesterday. The one I specially liked was the scientist who had to increase the band of frequencies covered by a wide band transmitter mounted in aircraft. He merely mounted a metal plate next to the tuning capacitor ("condenser"?), and the vibration transmitted by the plane's reciprocating engines happily varied the capacitance rapidly and achieved the wanted effect. German precision engineering, eat your heart out.

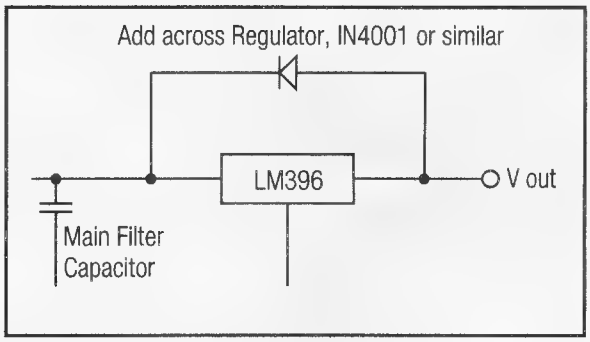
Scattered among hams in Australasia, the UK and the USA, are some of the survivors of those men and women in the services who operated radars during that war. You find them aplenty at the reunions of ex-World War II radar people that are still taking place. It appears that old radar operators never die: their traces just glow less brightly until they fade and disappear off the screen (and from the reunions). This book will have plenty of material to revive those memories and fuel more reminiscences at the reunions. The plentiful photos help jog memories, too. It's also a record of the pre-computer design era, when options were long and painfully evaluated, and shows how much drudgery the computer has taken out of design

ar

Modifying
a Linear Power Supply
to charge *Gel* Batteries

by Warren Stirling, VK3XSW

This project requires a linear (not a switchmode) power supply regulated for 13.8v dc and capable of supplying at least 4 amps over it's normal load current on a continuous basis. The modification adds a current limited, but not temperature compensated, output suitable for charging gell batteries in the 16 to 80ah capacity range.



IN THE EVENT of mains failure the battery is directly connected in parallel with the load and when mains power returns the battery is reconnected to a current limited output. This means that the battery will take longer to charge but extends the battery service life by limiting charge current surges.

The parts required are:

1 x 1 ohm 20 watt resistor
1 x 1k2 1/4 watt resistor
1 x 470uF, 35vw electrolytic capacitor
1 x 1N4001 diode
1 x relay, 10A DC (min) rated contacts, two changeover contact sets (dpdt) with a 24v DC coil, nominal coil resistance of 460 ohms

Circuit Operation:

When mains power is present the nominal voltage across the main filter capacitor of the power supply is 24v DC. The relay operates on application of this DC voltage via the normally closed output of one of the contact sets directly to ground.

The 470uF capacitor provides enough power to keep the relay operating (by discharging directly into the relay coil) so that the relay completes the changeover to the hold path which is via the 1k2 resistor to ground. Operating the contact set removes the short across the 1 ohm resistor so that the power supply output (13.8v DC nominal) is current limited by the 1 ohm resistor (about 3.5a DC into a dead flat battery).

In this configuration the relay will drop out when the voltage across the power supply main filter capacitor reaches approximately 18v DC. When the relay drops out the battery is connected directly across the load, via the relay contacts that now short out the 1 ohm current limiting resistor, while the power supply is still maintaining a regulated voltage to the load (albeit only for the time the filter capacitor in the power supply can maintain the load current in the absence of the mains input).

The relay works in this configuration because the current required to establish the magnetic field that moves the relay armature (operate current) is higher than the current required to maintain the magnetic field when it is established (hold current). In the prototype these two current values were measured at 52mA operate and 11mA hold.

The relay in the prototype operated at 21v DC applied, but dropped out just below 5v DC. The theory is the 1k2 resistor drops 13.2v DC (coil hold current of 11mA x 1200 ohms), the relay needs 5v DC across the coil to stay operated therefore the relay will drop out at approx 18v DC.

While the relay in the prototype is specified as a 24v DC coil relay, the contact set changed over with 21v DC applied to the coil. The 3 volt difference between these two readings is the increase in the coils magnetic field required to apply tension to the contact set so that the resistance of the contact set in minimal, in other words while the contact set changed over at 21v DC applied, the mechanical tension applied to the contact set is low, so the resistance of the contact set is high, increasing the mechanical tension of the contact set reduces its resistance.

Determining The Relay Characteristics:

A variable voltage DC power supply and a multimeter are required to determine the relay characteristics.

Assuming a relay with a nominal 24v DC coil:

1. Measure the relay coil resistance and note it. Set the variable voltage DC power supply to 24v DC and connect it to the relay via the multimeter which has been set to measure about 500mA max.
2. Apply power and make sure the relay operates reliably. Note the current through the relay coil, this is the operate current.
3. Slowly decrease the power supply voltage until the relay drops out. Do this several times and note the current at the point just BEFORE the relay reliably drops out, this is I(hold), the hold current. Multiply I(hold) by the relay coil resistance to find V(hold), the minimum voltage at which the relay will stay operated.

   Better results are obtained using the hold current than the hold voltage as relays are inherently current operated devices. While this is a DC circuit and Ohms Law would dictate no difference using the hold current or the hold voltage to determine the value of the hold current resistor I have found using the hold current approach yields more repeatable results.
4. Measure the voltage across the main filter capacitor of the linear power supply to be modified.

In the prototype the relay coil resistance is 460 ohms, the operate current is 52mA, the hold the hold current is 11mA, (thus the hold voltage is 5v) and the main filter capacitor voltage is 24v.

To determine the value of the relay hold current resistor use the following formula:

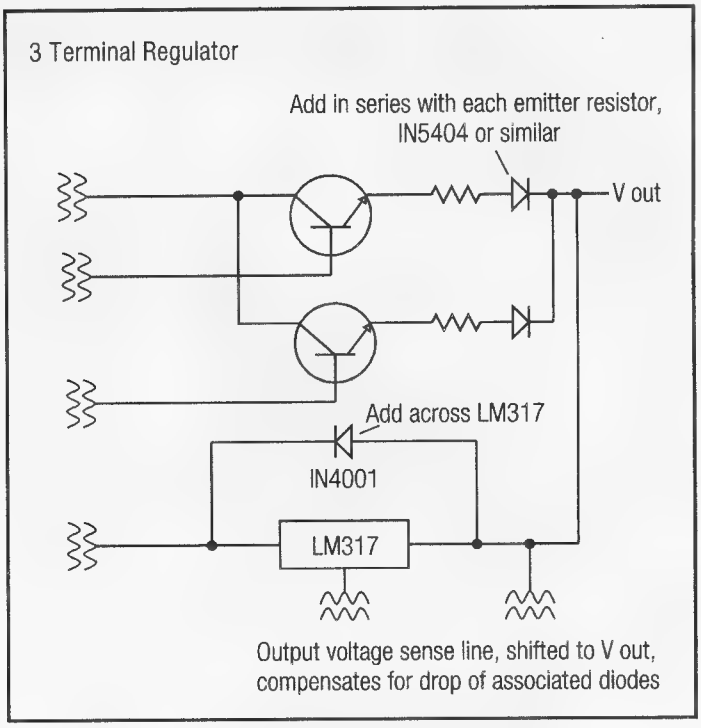
R(hold) = [V(filter capacitor) - V(hold)] / I(hold).

Note: R is in ohms, V is in volts and I is in amperes.

In the prototype this gives a value of 1.73K ohms. I used 1.2K ohms which increases the hold current from 11mA to 16mA, just to make sure the relay stays operated; after all 11mA is the MINIMUM value of the hold current and doesn't allow for drops in the filter capacitor voltage due to high load currents, mains fluctuations etc.

Modifying A Linear Power Supply To Survive A Battery As Its Load:

This is easily done where the regulator in the power supply is a single 3 terminal device such as the LM396K as is slightly more complicated where the regulator is a block consisting of a control element driving series pass transistors, the most common example of this is the LM317K driving 2N3055 transistors via another transistor.

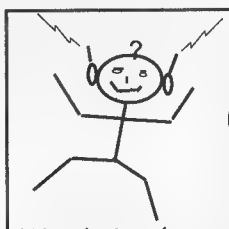


In both cases the normally reverse biased diodes need only be 1 amp devices while the normally forward biased devices need to be at least 5 amp devices, depending on the number of pass transistors and the total load current.

Notes:

The choice of relay, its characteristics and the value of the current limit resistor will determine the relay drop out voltage but it MUST be higher than about 17 volts so that the battery is connected while the power supply regulator is operating (13.8v DC output and approx 4v drop across the linear regulator). This minimises the voltage spike that will occur when the battery is switched directly across the load.

The power supply MUST be able to survive a battery across its output in the absence of mains power. Most linear power supplies can be modified to do this. The ability of the power supply to be started with a load of approximately (4 amps + its normal load current) is also a requirement (allowing for the power supply to start with a dead flat battery across the output while powering its normal load). ar



Situation Vacant

Cartoonist/Illustrator

(fee paying position)

We obviously need a cartoonist/ illustrator for the pages of *AR*. We seek an artist economical of line, quick on the draw, knowledgeable about amateur radio and with a slightly wicked sense of humour.
Location is unimportant but you must be contactable by fax or preferably email.
You must be able to work undirected from galley proofs.

How to apply

Pick several stories from this edition of AR, do a cartoon or illustration and fax/email it, with your details and charges, to

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2-Way Coax Switch

A heavy-duty, 2-way coax switch suitable for amateur, CB or commercial applications. It is well constructed with a die-cast case and can handle up to 2kW PEP or 1kW CW at 30MHz with less than 0.2dB insertion loss.
SO-239 sockets.

D 5200

$29.95
SAVE $10

1kW HF Antenna Balun

Designed as a centre support for wire dipole or yagi antennas, this 'T' shaped 1:1 balun has 52 ohm unbalanced input and 52 ohm balanced output.
An SO-239 socket is mounted into the base of the balun for easy coax connection.
RF input power handling is 1kW PEP maximum, and insertion loss is less than 1dB. It can handle the entire HF band of 3-30MHz.
RAK model BL-50A. Made in Japan.

D 5310

$49.95
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VX-5R 6m/2m/70cm Deluxe Hand-Held

Tiny yet incredibly rugged, the VX-5R provides 6m, 2m and 70cm amateur band operation with 5W output as standard (4.5W on 70cm), made possible by a unique PA design and a super high capacity 7.2v 1100mA/H Lithium-ion battery. Plus, ultra-wide coverage VHF and UHF as well as AM medium-wave and shortwave reception facilities are provided, along with a large backlit dot-matrix LCD screen. All this in a diecast aluminium enclosure just 58 x 87 x 28mm WHD (w/o knobs or antenna)!

Features

- Tx: 50-54, 144-148, 430-450MHz
- RX: 0.5-1.8MHz, 1.8-16MHz, 47-729MHz, 800-999MHz (cellular blocked)
- Full feature keypad, CTCSS encode/decode, digital code squelch
- Comprehensive menu system
- Over 200 memories
- 8 digit alpha-numeric memory labelling
- 5 battery saving systems, plus Tx/Rx usage monitor
- Spectra-Scope™ for monitoring adjacent channel activity
- Comes with FNB-58LI Lithium-ion battery, flexible antenna and AC adaptor/charger

D 3670

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VX-5R Accessories

CSC-73 Carry Case	D 3671	$26.95
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Yaesu FT-90R 2m/70cm micro mobile

Another engineering breakthrough from Yaesu – a tiny dual-band mobile rig with high power output, a remoteable front panel, and a rugged receiver front-end.

The FT-90R provides 50W RF output on the 2m band as well as 35W output on the 70cm band, a solid diecast casing with microprocessor controlled cooling fan for reliable operation, and a large back-lit LCD screen, all in a package measuring just 100mm x 30mm x 138mm.

Also includes:

- Wide dynamic range receiver for reduced pager breakthrough
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- 180 memories and a variety of scanning functions
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Includes MH-42 hand mic, DC power lead, and easy to follow instructions.

D 3312

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YSK-90 Front Panel Separation Kit D 3317 **$129.95**

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FT-50RD 2m/70cm Handheld

The Yaesu FT-50RD is an amazingly compact 2m/70cm amateur band handheld transceiver which provides MIL-STD 810 shock and vibration resistance, super wideband receiver coverage, simple menu settings for most functions, and compatibility with the optional Yaesu ADMS-IE software/interface package for PC programming of many functions.

Other features include:

- Tx 144-148MHz, 430-450MHz
- Rx 76-200, 300-540, 590-999MHz (cellular blocked)
- FTT-12 keypad provides Digital Voice Recording, CTCSS/DCS scanning, and CTCSS encode/decode
- 2m/70cm RF output: 2.5, 1.0, 0.1W standard, up to 5W with 9.6V battery or 12V DC socket
- "Omni-glow" LCD screen for easier night-time viewing
- 112 memory channels with 4 character alpha naming
- Dual watch allows monitoring of sub-band activity
- Direct FM modulation for better audio quality
- 5 battery saving systems (includes Rx and Tx Save)
- Comes with FNB-40 slimline 6V 650mA/H Nicad battery pack, flexible 2m/70cm antenna and modified M-9626 AC plugpack adaptor for Nicad charging

D 3660

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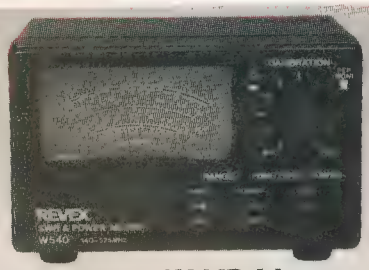

VHF/UHF Power/SWR Meter

A high-quality SWR/power meter suitable for Amateur, UHF CB and commercial applications. Durable Japanese construction assures you of maximum reliability. With an all-metal case, large meter display, 140-525MHz coverage with less than 0.3dB insertion loss, and 4W, 20W and 200W power scales. Revex model W540.

D 1370

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FT-2500M 2m Heavy-Duty Transceiver

Built tough to take the rough stuff, the Yaesu FT-2500M meets US MIL-STD 810C for shock and vibration so it'll provide years of reliable mobile operation. Its easy-to-operate front panel design, rubber coated knobs, and large Omni-Glow display are teamed up with a one-piece diecast chassis to set the FT-2500M apart from other 2m mobiles. For improved front-end performance, Yaesu's exclusive 3-stage Advanced Track Tuning feature and dual-FET mixer reduce overloads from strong signals while providing excellent sensitivity and wide-band receive operation.

Also includes:

- 31 tuneable memories
- 7 selectable tuning steps
- In-built CTCSS encoder
- Various scanning modes
- MH-26 hand mic, mobile mounting bracket & DC power lead.

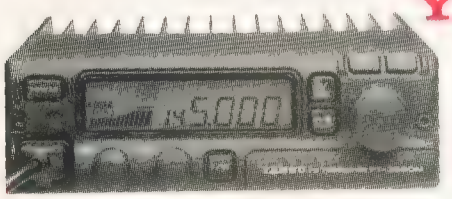
Specifications:

Frequency range:	Tx 144-148MHz, Rx 140-174MHz
Output power:	50W, 25W, 5W
Sensitivity:	better than 0.2uV for 12dB SINAD
Image rejection:	better than 70dB
Max audio output:	2.0W into 8 ohms (10% THD)
Dimensions :	160 x 50 x 180mm (W.H.D)

D 3632

2 YEAR WARRANTY

YAESU



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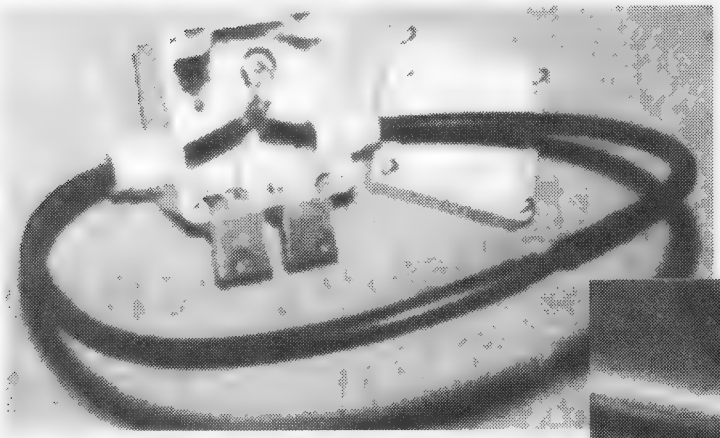
TECHNICAL ABSTRACTS

Gil Sones VK3AUI
30 Moore Street Box Hill South Vic 3128

Small HF Loop Antennas



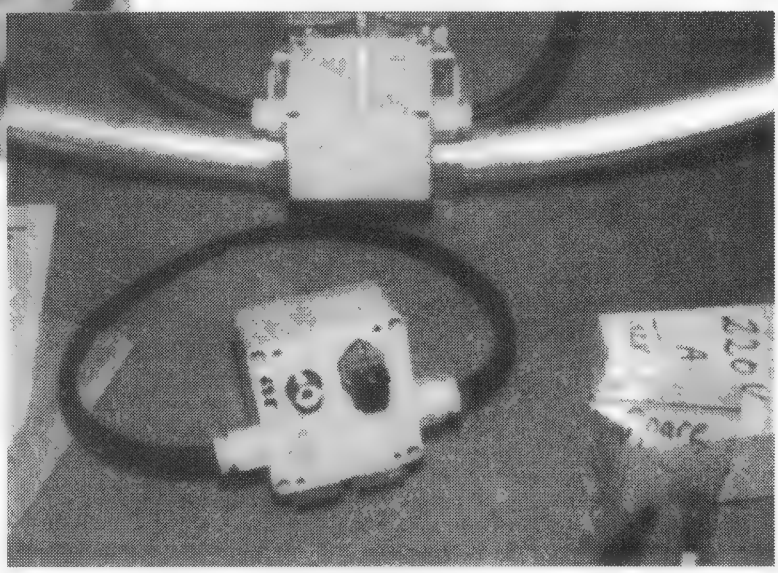


Fig 1. Original Loop of Patterson and the AMA Loop.

Loop antennas which are small with respect to the wavelength have been available from a number of sources. In the USA the AEA and MFJ products are well known and have been available in Australia. The German AMA series may be less well known but does offer a range of loops. The loops are often only a metre or so in diameter but there are versions which are two and three metres in diameter. The compact size of these antennas makes them attractive in many applications. They do have some limitations along with most small antennas.

IN THE JAPANESE magazine CQ Ham Radio September 1999 a survey of the small loop antenna was conducted by JG1UNE. A lot of information was presented but much of this is in Japanese. However there was some information which is of interest to those contemplating such an antenna.

The small loop first came to notice in an article in the magazine Electronics 21st August 1967 in an article by K Patterson describing some work on an army antenna. This was followed in QST May 1968 with an article by L McCoy. In the 1980's some articles appeared in CQ DL and Ted Hart W5JQR published an article in QST June 1986. In 1993 J Belrose VE2CV published an article in QST November 1993 which provided some details of his work with some loops.

There are a number of problems with transmitting small loops. They present some difficulties in efficient matching and their efficiency is low. The tuning components are highly stressed with high RF voltages and high circulating currents which can lead to losses and flashovers particularly if any more than modest powers are involved.

The bandwidth of the antenna is small and this must be so if any efficiency is being achieved in the structure and the matching.

The original loop described by Patterson in 1967 and the AMA loop of Chris Kaeferlein DK5CZ and Hans Wurtz DL2FA are shown in Fig 1. These differ in the tuning and matching. The earlier design used an arrangement of capacitors for the tuning and matching. This put quite stringent requirements on the capacitors and their connections if efficiency was to be achieved. The later design uses a coupling loop for matching and a separate tuning capacitor. The matching is easier and the tuning capacitor connections are simpler. The tuning capacitor must still cope with high RF voltages and large circulating currents. The Q is high and the bandwidth is quite narrow.

Table 1.

Type AMA	Diam m	Band m	dBD	dBi	Q	VSWR2 2:1 BW +/- Khz
4	3.4	160	-10.17	-8.02	3436	2
		80	-3.13	-0.98	2485	5.3
		40	-0.17	1.44	542	14
8	1.7	80	-9.44	-7.92	3969	2.1
		40	-2.49	-0.34	2459	4.3
		30	-1.08	1.07	1133	12
		20	-0.62	1.53	472	17
10	1.3	40	-4.18	2.03	3483	4.1
10D		30	-1.8	0.35	2001	9
		20	-0.89	1.26	927	10
		17	-0.6	1.55	457	17
		15	-0.52	1.63	299	18
13	0.8	80	-18.00	15.85	3635	2
		40	-8.82	-6.67	4469	3.2
		30	-4.63	-2.48	3906	6
		20	-2.23	-0.08	2549	10
		17	-1.23	0.92	1483	17
		15	-0.91	1.24	1023	18

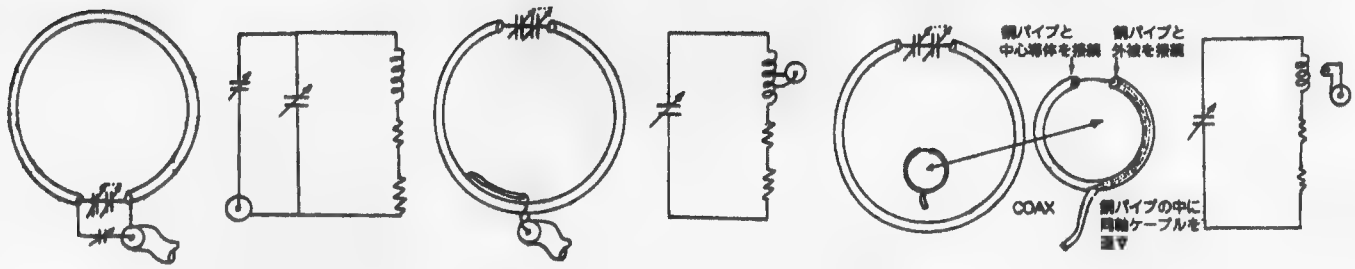


Fig 2.Three Loop Arrangements from W5QJR.

In Fig 2 which is the work of Ted W5QJR three different tuning and matching systems are shown. A plot of bandwidth against frequency for three loop sizes is shown in Fig 3. This is from the work of Jack VE2CV. The narrow bandwidth can be seen and the advantage of larger loop sizes at the lower frequencies is also shown.

The gain of four sizes of AMA loops is shown in Fig 4. The gains are largely negative where the loop has a circumference much less than the wavelength. A full wave loop is used in the Quad antenna. The gain is given in dBi which is dB relative to an isotropic radiator. A dipole has a gain of 2.15 dB relative to an isotropic radiator. Remember that short whip antennas also have negative gain due to losses.

The performance of some AMA loops is given in Table 1. These loops are made in Germany. Information can be obtained from Dipl. Ing. Christian Kaeferlein, D-64285 DARMSTADT Weinbergstrasse5 Germany (FRG). Tel +49-6151-61271. E-mail: kaeferlein-elektronik@t-online_de .

The AEA and MFJ loops have been available at times in Australia and you should try local distributors.

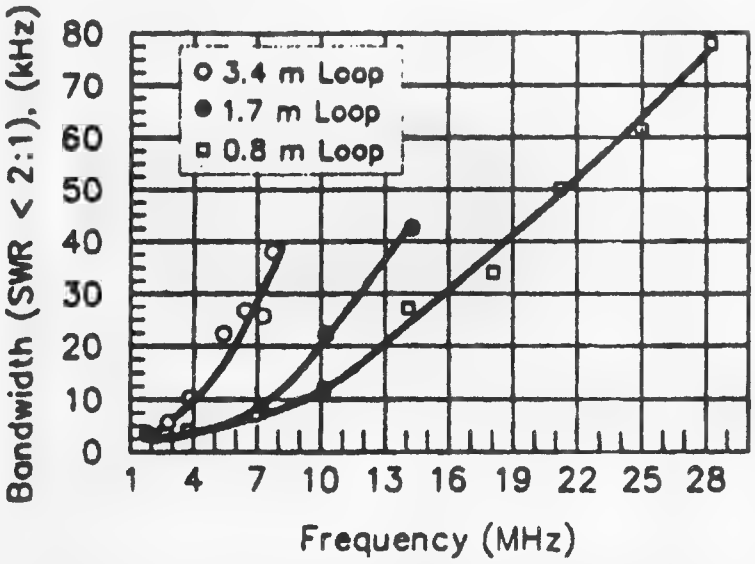


Fig 3. Loop Bandwidth with frequency from VE2CV.

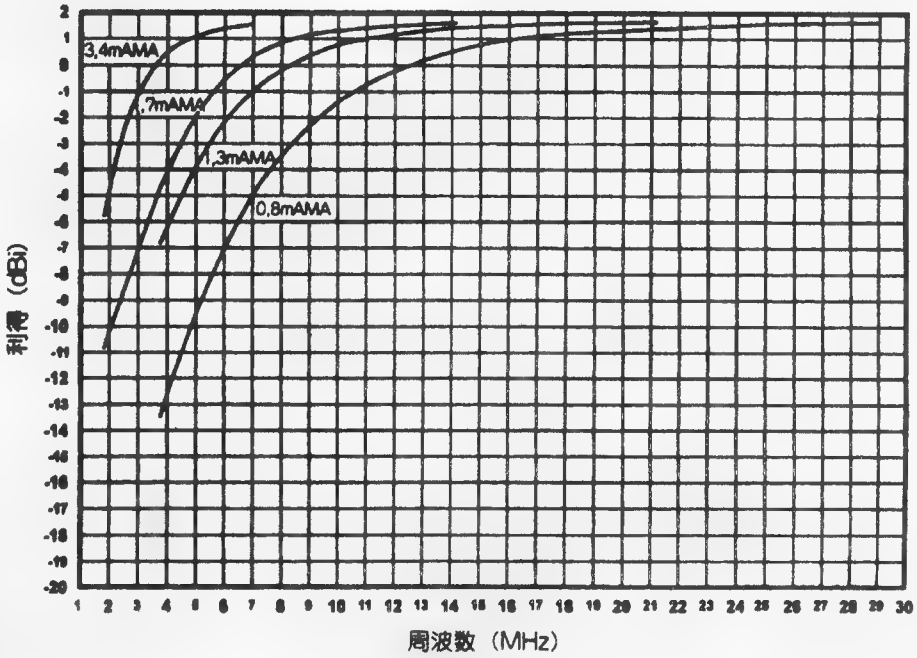


Fig 4. Gain in dBi of AMA loops.

RF Voltage Probe

A useful piece of equipment when working on RF circuits is an RF voltage probe. This enables RF voltages to be measured and displayed on an ordinary multimeter or digital voltmeter. An analogue meter is useful as it will allow easy peaking of circuits. However a digital meter will do particularly if it has a bar graph facility.

A simple and effective RF Voltage Probe appeared in the Technical Topics column of Pat Hawker G3VA in Rad Com October 1999. The item came from John A Share G3OKA.

The circuit and the simple circuit board are shown in Fig 5. The component leads

continued next page

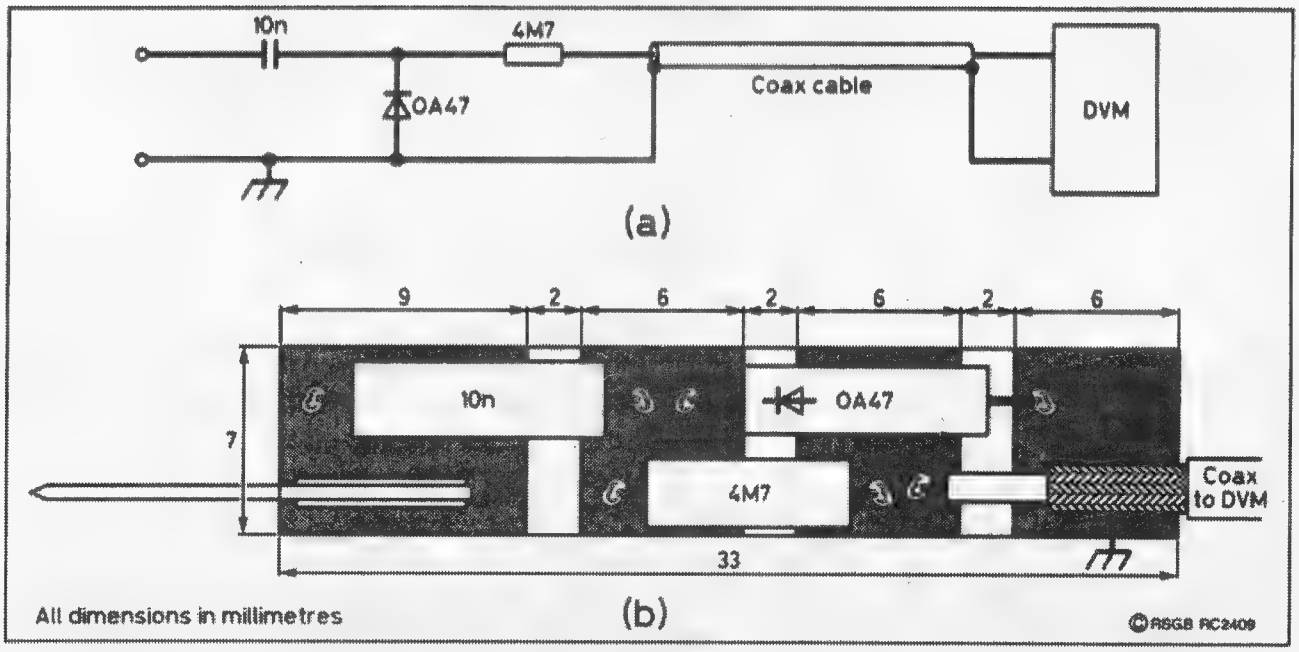


Fig 5. RF Voltmeter Probe.

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should be kept very short to gain the best VHF performance. The circuit board in the original was a piece of single sided laminate with the pads separated using a craft knife. The circuit board was 7mm by 32mm and the circuit was covered with some heat shrink tubing. The diode used was an OA47 but a general purpose Germanium diode would be suitable. The voltage characteristic of a Silicon diode is not ideal for this circuit.

June Fox WIA Federal Office is holding the Magazines with the original diagrams etc.

ar

Try This

Make LIPDs work for you

by Wally Watkins VK4DO

Living and maintaining a 2.6ha property has its problems while at the same time trying to monitor an Amateur band when away from the shack.

The answer is a LIPD. The November 98 "Silicon chip" magazine had an article entitled *An FM transmitter for musicians* and is available in kit form.

By leaving the microphone out and connecting the receiver output to the line-in terminals, your new LIPD will bring to life the Amateur band of your choice. Using a quarter wave vertical, the signal is Q5 anywhere on the property. A small FM receiver is quite adequate.

The kit is easy to build and if you find a clear spot between 88 and 89 MHz the stability is very good. Even inside the house, monitoring while watching TV etc, is no problem.

ar

CONTESTS

Ian Godsil VK3DID,
57 Nepean Highway, Aspendale, 3195

Contest Calendar January 2000 - March 2000

Jan 1/2	**Original QRP Contest**		
Jan 7-9	**Japan International Low Band DX Contest**	**(CW)**	**(Dec 99)**
Jan 15/16	**Summer VHF-UHF Field Day Contest**	**(CW/SSB)**	**(Dec 99)**
Jan 16	**Ross Hull Contest - Final Day**		
Jan 16	**HA DX CW Contest**		
Jan 28-30	**CQ WW 160m DX Contest**	**(CW)**	
Jan 29/30	**REF CW Contest**		**(Jan 00)**
Feb 5/6	**Ten-Ten Winter Party**	**(SSB)**	
Feb 12/13	**WW RTTY WPX Contest**		
Feb 12	**Asia-Pacific Spint**	**(CW)**	**(Jan 00)**
Feb 19/20	**ARRL International DX Contest**	**(CW)**	**(Jan 00)**
Feb 26/27	**RSGB 7 MHZ Contest**	**(CW)**	**(Jan 00)**
Feb 26/27	**REF SSB Contest**		**(Jan 00)**
Feb 26/27	**Jock White Field Day NZ**	**(CW/SSB)**	**(Jan 00)**
Feb 27	**High Speed Club CW Contest**		
Mar 4/5	**ARRL International DX Contest**	**(SSB)**	**(Jan 00)**
Mar 11/12	**RSGB Commonwealth Contest**	**(CW)**	
Mar 18/19	**Russian DX Contest**	**(CW/SSB)**	
Mar 25/26	**CQ WW WPX Contest**	**(SSB)**	

Thanks this month to UA9CDC F6HJO ARRL NZART JE1JKL VK5OV

SPECIAL NOTE: Please check the Calendar for correct dates of **Ross Hull** and **VHF-UHF Field Days**. All dates correct in published Rules.

GREETINGS TO EVERYONE and I hope that the New Year will be a good one for you.

Things are rather quiet on the contesting scene at present,but those really interested can still find some activity almost every weekend.

I particularly ask your support again for the Ross Hull and VHF-UHF Field Day contests. Possibly they will be over when you read this, but even so I trust that you have them in your diaries.

Next on the local scene will be the John Moyle Field Day in March. Here is another excellent opportunity to try VHF - after all, it was the flavour of the month in November/December with some Divisions promoting Awards for operating on the higher frequencies!

Please take the opportunities of quieter times to check through your equipment. Lately there has been an increase in QRP activity on some bands, so perhaps you could give these operators a call and help them on their way.

For some reason the REF Contest details did not appear in December, so I list them here.

73 and good contesting. Ian VK3DID
<vk3did@eudoramail.com>

RESULTS REF CONTEST 1999 CW Section (Call\cat\score)

VK2AYD	MO	10175
VK4TT	MO	546

RESULT RUSSIAN DX CONTEST 1999 (Call\band\mode\score)

VK4TT	14	SSB	20340

RESULTS 1999 AUSTRALASIAN SPRINTS from David VK5OV, Contest Manager

CW (Call\score)

VK2QF	23**	VK3DID/QRP	17*
VK2RJ	19	VK3YE/QRP	10
VK8AV	15		

Phone (Call\score)

VK3IO	43*	VK4JAE/7	24*
VK3DID/QRP	25	VK7JGD	23
VK5PO	46**	VK8AV	16*
VK5NOS	29	ZL3GL	11*
VK5KH	26		
VK5UE	24	SWL Ian McGovern	49*
VK5OV	19		
VK5RV	17		

CONTESTS

continued

REF CONTEST 2000

CW: January 29 - 30

SSB: February 26 - 27

0600z Sat - 1800z Sun

OBJECT is for foreign stations to work as many French stations as possible once per band.

BANDS: 80m - 10m (no WARC).

CATEGORIES: Single operator; Multi-operator single tx; SWL.

EXCHANGE RS(T) plus serial number. French stations will send RS(T) plus department number.

SCORE: one point for stations in own continent, three points for DX stations.

MULTIPLIERS on each band will be departments, 00 and 99. **FINAL SCORE** is total QSO points X sum of multipliers.

SEND LOGS by 14 March (CW) and 14 APRIL (SSB) to:

REF Contest, BP 7429, 37074 TOURS CEDEX (FRANCE)

ARRL INTERNATIONAL DX CONTEST

CW: 19-20 February

SSB: 4 - 5 March

0000z Saturday - 2400z Sunday

OBJECT: to work as many W/VE stations in as many states and provinces as possible.

BANDS: 160m - 10m (no WARC).

CATEGORIES: Single operator all bands QRP (max. five watts o/p), low power (max 150 watts o/p) or high power (more than 150 watts o/p); single operator single band. [Note: use of spotting nets prohibited in this category.] Single operator assisted; multi-operator single tx, two tx or multi-tx. 10 minutes rule applies to single and two tx.

EXCHANGE: RS(T) plus three-digit number for o/p power. W/VE stations will send RS(T) plus state or province.

SCORE: three points per W/VE QSO.

MULTIPLIER: total number of US states and Canadian Provinces worked per band.

FINAL SCORE is total QSO points X total multipliers.

LOGS must show all information, with multipliers marked at first time of working. Logs with more than 500 entries should include a dupe sheet.

SEND LOGS to: ARRL Contest Branch, 225 Main Street, Newington, CT 06111, USA. Entries may be on paper; on official entry forms; on 3.5 disk in ASCII format; or via e-mail to: <contest@arrl.org>

SUMMARY SHEET with signed disclaimer should accompany each entry.

RSGB 7MHZ CONTEST

26 - 27 February

1500z Sat - 0900 Sun

BAND: 40 metres.

MODE: CW.

CATEGORIES: single operator, multi-operator single tx, SWL.

EXCHANGE: RST plus serial number. UK stations will send RST plus county code.

SCORE 30 points for QSO with UK stations.

MULTIPLIER: each UK county worked.

FINAL SCORE is total QSO points X total multipliers.

SEND LOGS to: Steve Knowles G3UFY, 77 Benson Manor Road, Thornton Heath, Surrey, CR7 7AF, England, by 8 April.

JOCK WHITE FIELD DAY (NZART)

26 - 27 February

0200z - 1100z then 1700z - 2400z Saturday

0000z - 0200z Sunday

OBJECT: VKs to work as many ZL field day stations as possible.

BANDS: 80/40m.

MODES: CW/SSB.

EXCHANGE RS(T) plus serial number. ZLs will send RS(T), serial number and branch number. Stations may be worked once on each mode and band once per hour (total 18 hours).

SCORE: three points per phone QSO, five points per CW QSO.

FINAL SCORE is total QSO points X total number of different branches worked.

SEND LOGS to: Stan White ZL2ST, 19 Rossport Street, Johnsonville, Wellington, NZ, by 24 March, 2000.

ASIA-PACIFIC SPRINT

CW: 12 February

SSB: 10 June

CW: 21 October

1230z - 1430z

BANDS: 40/20m

MAX. POWER: 150w o/p.

CATEGORY: single operator single tx.

EXCHANGE: RS(T) plus serial number beginning 001. Stations may be worked only once per band.

MULTIPLIER: prefixes per WPX rules once only, not once per band.

FINAL SCORE: total QSOs X multipliers. QSY at least one kHz after each QSO (CW) or 6 kHz (SSB).

SEND LOGS on paper or disk in ASCII format to: James Brooks, 26 Jalan Asas, Singapore 678787 within 7 days. Logs may be sent by e-mail to: <jamesb@pacific.net.sg> within three days.

Mid South Coast Amateur Radio Club Inc

NETS

Each Wednesday

3.617 MHz at 1930 hrs and

146.700 MHz at 2030hrs on our repeater VK2RMU

These nets are run under the club's callsign VK2HQ

Amateur Radio apologises that this information was omitted from the NETS list in October AR.

VHF UHF AN EXPANDING WORLD

David K Minchin VK5KK
PO Box 789 Salisbury South Australia 5108
E-mail: technolt@arcom.com.au Web page: http://www.ozemail.com.au/~tecknolt
Fax: +61 8 8234 6396 Phone 0414 808060 (before 2130 EST please)

All times are UTC

Well .. We made it !!

THIS COLUMN MARKS the passing of more than one milestone. Put bluntly, Eric is a hard act to follow! While I have written or compiled a few of the columns over that last 20 years, readers may have to bear with me as I find the groove!

Little is to change. One of the column's main functions is that of reporting what is happening on the VHF and above bands, in various parts of VK. Overseas information is included, where there is some parallel with our own situation.

The printed media has not been the fastest way of communicating since the beginning of our hobby! With the pressure of deadlines, a good 4 weeks can lapse between writing and delivery. This does put some strict guidelines on what goes into the column.

In talking with Eric, during the changeover, some light appeared on what is most important in the column. Magazines do tend to stick around as reference material for a fair part of the active life of an Amateur. Because of this an important role of the column is simply to record a large amount of operating information for future dissection and perhaps posterity.

If you have something of interest, drop me a line. Email is the preferred method as I spend a deal of time in other states. Fax and snail mail are also alternatives.

Six metres into Broome, W.Aust

The Cycle is upon us! If you were planning a move to the northern parts of VK for the next few years to work 6 metre DX, you should already be there! Bill Webber, VK6JQ, Broome (PH12c), has sent in the following report. Bill writes...

Six metres is alive and well again. I have enclosed a list of those heard and worked in Europe up to 25th of November, also Pakistan in Zone 21 and Tajistan in Zone 17.

Those in bold are new countries for me. Up to the beginning of October I had only worked 47 countries in total with only 44 confirmed. My new total is 61 at the end of October with still 44 only confirmed.

VR2XMT said he worked I, OD, 4X, JY and either 9A2 or 9H on 24 October.

This opening (season) *has resulted in 92 contacts with 82 stations in 31 Countries (*Not including EY8 and AP2 worked 10/10 and 15/10 ... 5KK*) over 13 days between 24th OCT. and 18th of Nov. Of the 31 Countries, 14 are new countries on 6 Metres.*

The following is an extract from Bill's Log listing stations worked for this equinox as well as some other stations heard. All contacts (mostly on CW) were made using a TS600 – 10 watts to 6-element yagi up 12 metres.

10-10 0653 EY8CQ 579, 0702 EY8MM 559

15-10 0910 AP2WAP 559

16-10 0750 AP2WAP 559

18-10 0747 AP2WAP 539,

24-10 0852 IT9RZR 519 heard, 0903 Z32ZM 539, 0903 IS0QDV 539, 1015 UR2LCV 419 heard, 1122 UR2LCV 419 heard, 1143 SV5BYR 559, 1213 9H1BT 419 heard

25-10 0838 SP2SGZ 52 heard, 0921 SP5XMU 51 heard, 0942 SP6CPH 559, 1000 OM1TW 319 heard, 1005 OM1TLS 559, 1012 SP6ASD 559, 1053 DL6AMI 529 heard, 1056 I0WTD 579, 1100 IK7XIV 539, 1104 IW9CRE 52 heard, 1106 UU7JM 539, 1113 EH3ADW 539, 1122 IK7MCJ 559, 1128 LZ1JH 529, 1137 9H1EL 549, 1145 SV1DH 599, 1149 SV1AHX 529 heard

26-10 0853 F8OP 529, 0921 HB9QQ 569

27-10 0944 HB9QQ 519 heard, 0946 HB9QQ 579, 0952 HB9QQ 55, 0955 SP4MPI 419 heard, 1000 F4PAN 519, 1013 F1IXQ 53 heard, 1017 IW1DIM 52 heard, 1019 OE6BMG 419 heard, 1026 F1IXQ 59 heard, 1038 IZ0COK 52 heard, 1048 I8LPR 319 heard, 1132 EH7AGW 319 heard, 1147 EH3ADW 319 heard, 1157 F8VQ 319 heard.

28-10 0718 4X1RF 319 heard, 0731 SM4DHN 529, 0753 SM3EQY 52, 0807 SV1DH 529 heard, 0809 SM0AJU 599, 0843 OZ7DX 51 heard, 0851 SM7BYU 529, 0903 ON4GG 539, 0913 PA0LSB 579, 0916 PA0HIP 589, 0920 ON4AOI 579, 0935 ON4CBA 579, 0940 DK9KX 569, 0946 DJ5JK 549, 0956 DL6AMI 549, 1001S SP4MPB 529, 1007 EH3AR 529, 1014 EH3ADW 539, 1042 CT1EET 52 heard, 1108 F5OVQ 419 heard

29-10 0744 EY8MM 31 heard, 0832 EY8MM 41 heard, 0924 AP2WAP 529 heard, 0946 AP2WAP 529 heard, 1005 F1IXQ 569 heard

31-10 0804 OH2BC 529 heard, 0824 SM7FJE 549, 0828 YU7FU 419 heard,

0835 ER5WU 539, 0858 YU1EU 539, 0918 DL7QY 599, 0925 DL3IAE 569,

0938 DL3RBH 559, 0946 SP2NJE 319 heard.

1-11 0734 SP2NJE 549, 0739 OE2UKL 559, 0746 DL7AV 599, 0753 OE5UAL 57, 0811 SP2NA 529 heard, 0837 SP5EWY 539, 0845 ON1TL 56 heard

2-11 0807 DJ5CL 519 heard, 0809 DF3CB 529 heard, 0858 OM1TL 419 heard, 1044 SP5MPB 319 heard, SM7FJE 519 heard

3-11 0751 UR5W? 219 heard, 0752 F8OP 539, 0758 IK2GSO 529, 0813 OH2BC 559, 0820 OH2BC worked 7J6CCU, 0835 OH1TN 539, 0947 YL3AG 559 heard, 0956 DL3DXX 559, 1009 SP5BAK 529

4-11 0841 SM7AED 219 heard only

5-11 0746 OH2BC heard working 9M6JU, 0811 SM6CIU heard working 9M6JU,

0814 PA0HIP 419 heard, 0922 SM7FJE 529 heard

6-11 0732 JY9NX 539, 0825 OM1TL 589, 0840 OM1BM 519 heard, 0857 OM4FF 539, 0904 US5CCO 56, 0907 IK4ORY 559 heard, 0917 EH7KW 519 heard, 0926 OE3OKS 519 heard, 1009 Y02IS 529, 1017 Y02DM 539

8-11 0726 UU7JM 519 heard, 0732

UR5LZ 519, 0737 OH2BC 599, 0739 Y02IS 599, 0745 OH2BC 589, 0747 ES1CW 559, 0752 5B4FL 539, 0801US4CCD wked VK4APE on SSB, 0816 YL3AG 589, 0856 SP6ASD wked VK2BA, 0858 OZ7DX 56, 0905 HB9QQ 529 heard, 0958 UR5LX 539, 1003 F1MXE 539, 1054 CT1EEB 539.

9-11 0750 US5CCO 319 heard

10-11 0748 IK1YWB 219 heard, 0846 9A8A 529, 0853 S57ACE 539, 0854 9A3HZ 549, 0902 9A7V 579, 0914 S53X 569, 0920 9A1EZA 539, 0926 YT1AU 539, 1004 F1IXQ 569, 1034 EH3ADW 519

12-11 0946 EH3ADW 519 heard

14-11 0721 YU1EU 529, 0738 YU7FU 529, 0743 EY8MM wked VR2LC, 0818 OM3ZDM 579, 0834 OM1BM 569, 0844 OK2BGW 529, 0857 S59A 589, 0908 PA7MH 529, 0915 DK2PH 559, 0935 ON9CFB 539, 0944 DL8YHR 529, 0957 LZ2HM 559, 1001 LZ1KDP 549, 1012 LZ1OP 569, 1030 DL6AMI 529

18-11 1033 PA0HIP 219 heard, 1038 F5HA 529, 1044 ON5SE 519 heard, 1047 F6FRR 529, 1113 JY9NX heard wking VR2LC, 1126 LZ1HM 319 last signal heard from Europe.

Phew! I might stand corrected but is the contact with SP6CPH the first VK to Poland QSO? (Nothing like putting your nose out in the first issue!).

Six metres... Still more!

This equinox just past has resulted in a number of international contacts from VK2,4,6,8. A number of W – VK contacts have occurred and been reported in previous columns the following covers some of the other areas. The southern states will all be praying for a good autumn equinox!

17/10, David Vitek, Parkholme SA reported on MUF variations through October Showing peaks from 0415 – 0510 with 49.750 plus 746, 755, 758 offsets and JA7 & JA8 into Adelaide around the same time. MUF to USA path barely above 35 MHz through the whole period till November with Asian MUF rising to 40 MHz on occasion. Looks like VK5 has a way to go yet!

31/10 VK4FNQ worked YU7FU, YU1EO & YO4AUL as well as F5JKK, Overseas, Europe had its first extensive South American opening on 12/10 perhaps the best since 2/11/1991...G4UPS 6 Metre Information.

11/11, John VK4KK, Brisbane noted an opening to Italy commencing around 0754. Des VK4DMI was the first to hear the Italian stations and alerted John. VK4KK worked IZ5EME, IK5YJY and IW0GPN, all around 5x5. Main signals to alert for European openings are the video to be found on 48.238, 48.250 and 48.280 with the first the main one. Several others in the Brisbane area also worked. Brisbane boys also recently worked TI5 and HP2 one morning.11/11, Don VK6HK, Perth, also worked into Europe around 1000, no further details than that F, DL, ON, OZ, PA, SP was worked from the Perth area.

2/12, Rex VK7MO reports ... *6 Metres was open to JA from VK7 from 0330 to 0420 UTC.*

Emil Pocock, W3EP reports ... *Surely some of the most exotic and exciting DX news of the month came from Asia, thanks especially to Hatsuo Yoshida, JA1VOK. He reports that JR6DGU, JR6HI, 7J6CCU, and others in the Ryukyus (the southern most of the Japanese islands) continued to lead they way. Their catches for the month included 5R8GJ (Madagascar), 7Q7RM (Malawi), 9U5D Burundi), AP3WAP (Pakistan), EY8MM (Tajikistan), and UU7JM (Ukraine). JR6HI heard ZD8VHF/b on October 6 around 0100.*

Japanese in most of the rest of the remaining call areas had to make do with S21ZE (Bangladesh), 9V1UV (Singapore), BV2DP (China), FOØKOJ, A35SO, and ZP5CW (Paraguay). Other Asian stations made incredible contacts. BV2DP worked VQ9DX (Chagos), VK8MS, and KHØ/JK3HLP (Marianas), along with many Japanese, on October 1. VR2XMT (Hong Kong) logged PYØFM, AP2WAP, EY8MM, FR1GZ, 5R8GJ, 9V1UV, SV5BYR, 4X1RF, OD5SX, JY9NX, SV1DH, and two 9H (Malta) during the month.

In addition to Japan and Hong Kong, EY8MM worked 5B4FL (Cyprus), JY9NX, 4S7 (Sri Lanka), 9M2TO (West Malaysia), and DU (Philippines) on October 8 and 9. S21ZE ran 434 JAs in all call areas save JA8, BV, VR2, HL, KHØ, and V7 between October 14 and 18. Finally, YJØDX (Vanuatu) made a long-path contact with TZ6VV (Mali) on October 30 at 2121. There was a lone report of a US contact with East Asia. Erik Dean, N6XP (DM06), made an unusual southerly skewed-path contact with JA9CGR on October 18 at 0142

YO4AUL logged a series of notable contacts with VK4ABW, VK4BW, and VK4FNQ.... thanks to W3EP & QST.

VHF-UHF Pioneer Paul M. Wilson, W4HHK, Silent Key

The following bulletin was received from the ARRL via W1AW

VHF-UHF pioneer Paul Wilson, W4HHK, of Collierville, Tennessee, died November 29. He was 75.

A stalwart in the 144-MHz and Microwave Standings, Wilson remained active right up until his health deteriorated earlier this year. In early July, he completed his VUCC on 10 GHz. He celebrated his 75th birthday in September by making his first contact on 24 GHz. "Paul's life should inspire every amateur to strive to always try something new in Amateur Radio, regardless of age or health," said ARRL Vice President Joel Harrison, W5ZN—a friend of Wilson's. "He has definitely been an example for me."

Wilson got his ham ticket in 1941 at the age of 16. While still in high school, he began experimenting on the old 2-1/2 meter band (112 MHz). After World War II, he rekindled his interest in VHF and UHF, becoming a major figure on the then-new 2-meter band.

During the 1950s, he got involved in meteor scatter propagation. In 1954, W4HHK and Tommy Thomas, W2UK in New Jersey sent and received reports via 2-meter meteor scatter over a 950-mile (1520 km) path—a first! W4HHK and W2UK won the ARRL Technical Merit Award for 1955.

Wilson took on the challenge of Earth-Moon-Earth propagation as well, and in 1961 he began work on an 18-foot dish. He was among those making their first 70-cm EME contacts in July 1965. From that frontier, he moved on to attempt 2304 MHz moonbounce, and he won the ARRL Technical Merit Award for 1969 for his work on that band. In 1970, W4HHK and W3GKP claimed a new record—the first 2304-MHz EME contact.

In 1972, Wilson used his 18-foot dish to monitor the Apollo X command module on 2.2 GHz as the astronauts orbited the moon. He received a NASA confirmation of his reports in the form of a photograph signed by all the astronauts on the mission.

Noted VHF-UHFer Al Ward, W5LUA, called Wilson "a true VHF pioneer and said he would be missed. "Paul's signal on 2304 EME was like a beacon station, and his presence will be missed by all who have worked him in the last 29 years off the moon," Ward said.

Wilson retired in 1980 after 30 years as an engineer for TV station WMC in Memphis. His wife "DB"—to whom he was married for 54 years—is W4UDQ. His son, Steven, is N4HHK.

A staunch League supporter and ARRL Technical Adviser, Wilson was frequently in the pages of QST over the years—both as an author and as a subject. In his December 1999 QST "It Seems to Us . . ." editorial, ARRL Executive Vice President David Sumner, K1ZZ, singled out Wilson as an Amateur Radio hero for his pioneering accomplishments.

The Central States VHF Society awarded Wilson its Chambers Award in 1986 for "his continuing technical contributions to UHF, especially EME on 13cm."

... QST de W1AW

Esperance 2 metre Beacon

Wally, VK6KZ writes ... *Bill (VK6AS) put the beacon back on air on Friday 12 November with the new antenna and new coax. Hasn't been heard here - yet - but conditions to Esperance only fair last couple of days....* VK6KZ Wally also indicated that the Albany beacon is on the air but has still not been heard in Perth. It certainly has not been heard in VK3/5 for well over a year now! There are some discussions about the possibility of moving the beacon to Mt. Barker, 50Km north of Albany.

Summer VHF-UHF Field Day 2000

John Martin VK3KWA, contest manager, reminds us that the next Summer VHF-UHF Field Day will take place on January 15 and 16, 2000. The contest rules are the same as for the 1999 Spring Field Day. Please note the couple of minor changes that were discussed in more detail on page 48 of October 1999 "Amateur Radio".

The next Field Day should provide plenty of opportunities. It will take place over the last weekend of the Ross Hull Contest, so there will be extra home stations there to work. And if you live in Tasmania or anywhere within reach of it, remember that any Field Day contacts can be counted for the new George Bass Diploma offered by WIA Victoria.

Duration: VK6 only: 0400 UTC Saturday January 15 to 0400 UTC Sunday January 16, 2000. All other call areas: 0100 UTC Saturday to 0100 UTC Sunday.

The Contest is split into the usual Four Sections

A: Portable station, single operator, 24 hrs.

B: Portable station, single operator, any 6 consecutive hours.

C: Portable station, multiple operator, 24 hrs.

D: Home station, 24 hrs.

Single operator stations may enter both Section A and Section B.

If the winner of Section A has also entered Section B, his log will be excluded from Section B.

Logs must be received by Monday, February 14, 2000. Early logs would be appreciated. Logs may be posted to: WIA VHF-UHF Field Day Manager, 3 Vernal Avenue, Mitcham, Vic 3132. Logs may also be e-mailed (in ASCII text form ONLY) to jmartin@xcel.net.au.

Second Weekend ARRL EME Contest

Mike, VK2FLR was active during the 27/28th of November "Second Weekend" ARRL EME Contest. Mike made contact with the following stations W0HP, OZ1HNE, DL5MAE, DL7MAT, I3DLI, SM2BYA, PA2CHR, DK3BU, IK1MTZ, K6MYC, VE3KH, DJ6FU, DL5MN, DJ7OF.

Mike writes ... *Missed N2WK, 9A4FW, (heard me but I couldn't hear them), F6BSJ (couldn't quite get the correct call), G3ZIG (loud here Roger, but you were not responding to my report), EA3DXU (not strong and ran out of time).*

Did not hear VE2JWH, VE1ZJ, W0PT, PE1LWT, IZ5EME, WB4JEM, and GD4IOM.

High local noise in my North American window on the first pass made copy almost impossible; much better on the second pass, but still no luck with the Canadian Maritimes - not enough moon elevation here to get out of the local noise field.

Polarity seemed to be moving rapidly all weekend, giving me brief periods of pile-up conditions. My apologies to those who called without a reply.

I will be open for skeds for the next couple of weeks, outside 1700-2200 UTC, ... VK2FLR

TROPO DX from VK3 – VK7

The events of the 29th and 30th of November showed some extraordinary Tropospheric conditions from VK3 – VK7. The following reports summarize the opening.

Barry, VK3BJM writes ... *Conditions were satisfactory (!) again last night over Bass Strait. I missed Sunday nights' activity (finishing installing new deep-cycle battery in the vehicle), so I was pleased to be on last night.*

At about 1015z (29/11/99) David, VK7DC, in Burnie (QE28), appeared on 144.1.

Having QSY'ed to 144.12, he was subsequently worked to death by VK3's XPD, KEG, BJM, TMP, CAT, AXH, KAI/p, WRE/p, YB, WR, GK, KAS, GRL, JEG, YE/p, AFW, KLO, KWA/p, DUT, JED/p, HY, DUQ, AL, CAT/m, BFW, KAB, XLD, and BRZ. 27 stations in one sitting.

Not content with that, David was persuaded to hook up his 70cm station, on which band he was worked by VK3's BJM, TMP, AFW, XPD, KAI/p, WRE/p, HY, DUT, KAB, BDL, BRZ, AL, and XLD.

David was using an IC-202 into a 12el yagi on 2m; I missed what David was using on 70cm, but I believe he was using a bay of 4 yagis, antenna-wise. Most reports were 5x9 + a lot, on both bands. Several QRP stations made contacts on 2m, VK3's YE/p (2.5w), JED/p (1w in 5/wave held horizontal), and KWA/pedestrian mobile, IC-202 with 1/4 wave whip.

Max, VK7KY appeared later on and was worked by VK3's BRZ, XLD and BJM, on 144.12. ... VK3BJM

Ron VK3AFW writes ...*Peter, VK7ZPB, on Flinders Is. was also worked by VK3AFW, VK3KLO and VK3BDL on 6m, 2m and 70 cm SSB last night (29/11/99). He was worked by several others on 2m. VK7RAE beacons on these three bands were all good copy last night. Signals were down this morning. Andrew, VK7XR, was just 5x9 on 2m. ...* VK3AFW

2 Metre TEP USA to South America

22/11 Ed WP4O ... worked CX9AF, CX9DX, CX1DIO, LW9EVS, LU7DJZ, LU9EUE and LU9AS all on 144 MHz with signals ranging from 53 to 59 plus 10db.

Microwaves and Above

This little segment will find its legs over the next few months. It has been a pet area of mine since 1976, and perhaps has been my main, perhaps only area of activity for the last 10 years!

We are now seeing pockets of activity growing in all mainland states with perhaps 10 Ghz being the most popular. Each month I will report on the various activities across the Country as well as some help for newcomers on where to look to get started. Over the next few months I will be gathering a "Microwave Activity List" for each state. If you want your details on the list, please send in callsign plus band(s) and etc equipment details.

In Closing

Gareth, VK1ANF has just returned from Vietnam ... *Just a brief note to say that I've just returned from several weeks in Hanoi, Vietnam, and noticed a number of taxis there with Kenwood 2 metre FM transceivers fitted. It's my understanding they use the transceivers to talk to their base. The frequencies I saw used were 147.350 and 147.450 MHz, and could explain some of the strange things we hear down under on 2 metres at certain times of the year ...* VK1ANF

That's it for this month. A lot of 6 Metre information after the Spring Equinox, with some luck the 2M and above bands will be more in focus over the summer months.

Lastly, Eric VK5LP has sent in a couple of items that are perhaps appropriate for this part of the column...

1. The Cure for boredom is curiosity. There is no cure for curiosity!
2. Middle age is when you know all the answers and nobody ever asks you the questions.

73's David VK5KK

ar

SPOTLIGHT on SWLing

by Robin L. Harwood VK7RH
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E-mail: robroy@tassie.net.au

Welcome to the New Millennium!

Yes the year 2000 has finally rolled around and the Third Millenium has been born yet technically speaking the 21st. Century does not start until midnight on the 31st of December of this year. Commercial interests have hoodwinked us into thinking the 20th Century has finished, yet the local newspaper published details of New Year's celebrations in December 1899, mentioning that the celebrations 12 months hence would see the birth of a new century.

OF COURSE, BY NOW we will know if the Y2K millenium bug will cause the havoc and inconvenience predicted by some. Many agencies have been planning for any contingencies that may arise and have been primarily relying on HF communications, in case the satellite communications are down or disabled. They have been using voice or analogue systems instead of data.

I know that the American Federal Emergency Management Agency (FEMA) will be running several nets around 5.2 mHz and between 10.3 to 10.5 mHz during the final week of December and beyond into January. The Canadians will also have an emergency Y2K communications network in case of any difficulties probably inter-linking with the FEMA network. The US Coastguard even requested the assistance of some radio amateurs over the same period, in case there were communication difficulties.

It is difficult anticipating what changes will happen over this year and into the 21st.Century. I expect some stations will undertake experimental digital broadcasts over HF. However there is no agreement over what standards are going to be employed because the Americans and Europeans have non-compatible systems, which is a disincentive to the mass production of suitable receivers or decoders. The use of SSB is to be phased in by 2015, yet more efficient technologies are being rapidly developed which could render SSB redundant. I do expect that a uniform digital system could emerge and quickly be implemented, yet analogue modes will continue because developments will be slower in some regions, such as south Asia or in Africa.

The increasing trend is for many international broadcasters to stream their output on to the Internet on various digital platforms such as Real Audio or MP3. This already has led the decline of broadcasts targeting Europe, North and South America and parts of Asia. However the number of simultaneous contacts over the Internet are limited by bandwidth at present to the hundreds, compared to the countless millions who readily access signals over either domestic or international radio. Also audio streaming over the Net, although possessing superior fidelity, can often drop out due to net congestion and insufficient bandwidth capacity.

Several meetings are held prior to the two major periods, coinciding with the adjustment of summer and winter times.

These are held to help broadcasters co-ordinate frequency planning, thus minimizing clashes. In reality this co-ordination process has been restricted to regional areas such as Europe and North America, with the inevitable clashes.

Early in November, Radio Netherlands in Hilversum found that their Bonaire transmissions to Australasia on 9820 kHz were being interfered by two stations. One was religious broadcaster, KTWR in Guam and the other was in China and both were broadcasting in Chinese. To complicate matters, a rather wayward Vietnamese sender also drifted on to the channel, causing a severe heterodyne. After being alerted by Australian and NZ listeners to this unsatisfactory state of affairs, Radio Netherlands shifted to 9790 kHz. This is a clear channel. Ironically, both the wayward Vietnamese and one of the Chinese speaking stations also have been quiet since the move. I also have noted another bad frequency clash between China Radio International and Radio Tashkent in Uzbekistan both targeting identical areas in English, on an adjacent channel.

I have been observing low-powered unofficial broadcasting stations, late at night between 3.7 and 3.8 MHz. Their frequency stability varies with the modulation, although nominally on AM. Their audio quality often is very poor. Tune around 1200 UTC on a good night when the summer atmospherics are not too bad and you will easily hear them, despite their erratic status

All the best for 2000 and hope that you will not have any glitches to your system.

Keep listening and 73-

Robin L. Harwood

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Have you tried

DXing, microwaves, CW, high speed data, ATV, operating portable, slow scan TV, QRP, contesting, homebrewing, AM, UHF, packet radio, foxhunting, building repeaters, JOTA, 160 metres

or

publicising amateur radio?

Write about it and send it to *Amateur Radio* - the magazine which covers more facets of amateur radio than any other.

REPEATER LINK

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rslt VK6UU@VK6BBR

Problems with pirates on 10 metre band

Feedback

Robert McKnight VK2MT took the time to E-mail me his comments regarding the operation of the Wollongong 10 metre repeater. Robert's comments were prompted by a reference made by Jack, VK2GJH, in a recent article in Repeater Link. Robert also promised an article about the trials of maintaining a repeater for a later article in Repeater Link.

VK2MT

Regarding Jack's (VK2GJH) comments about the perceived performance of our 29.620 Repeater, VK2RUW in Wollongong: I have to wonder what repeater he actually WAS accessing on 29.620MHz. Our repeater has largely been off air for the past year, apart from a few hours. This has been due to the large amount of pirate activity from the North. To see all the effort largely wasted due to this pirate activity is difficult to accept. For your information some history of the 10 metre repeater VK2RUW.

During the last Solar Cycle, our Club built our original 10m repeater. It was based on a modified Cybernet AM CB with Handheld UHF Tamaphones used for the link between the receive and transmit sites. It also ran a "Legs Lincoln" Amplifier. It was primitive, but it worked well. When that Cycle died away, our Club decided that as a long-term project, we would re-build and improve (based on previous experience) the 10metre Repeater in readiness for the next Solar Cycle. We procured 2 G-Band 828s (rare as hen's teeth), modified them, swapped receiver boards with a U-bander (toprovide site linking), built voice idents and DTMF controller, all inpreparation for this current Solar Cycle.

Now that the Solar Cycle has arrived, what do we hear on 29.520MHz the moment there is a slight lift in conditions – endless chitter chatter from our north. I have been using both the 10 and 11m bands since 1976, through a few solar cycles and I've never heard the pirate activity this bad. What can we do about? Not much, the horse has well and truly bolted. Intruder Watch may be able to help with the other HF Bands, but the huge amount of pirates on our 10m band is staggering. These countries don't care less about any complaints from down-under.

For your interest, Australia is not alone in this pirate problem. I have had some very interesting repeater contacts and E-mail with Roger W1OJ who runs a 29.620 repeater in Boston. We compared notes about many things regarding repeaters. For instance, Roger's repeater runs 1kW outputat 100% duty cycle! The system runs 2 receivers with GaAs FET pre-amps at both sites; the best received signal is selected at the transmitter site– not a bad system!

The Boston repeater is plagued with pirate stations on their receiver inputs, but their problems emanate from South America, from taxi drivers & resort islands etc. Interestingly, each of our relevant pirate problems originates from the opposite side of the equator, an obviously easy path for 10m signals.

As I said earlier, the current pirate problem is the worst I've ever heard it. We've been looking forward to this coming solar cycle for ages to get our new 10 metre repeater "pumping" with activity, but now it's here, it's looking like being a dead loss, for repeater operators anyway. Obviously, individual 10 metre users can tune around till they find a free frequency, but repeater inputs aren't quite so frequency flexible.

What's the answer? I guess "populate or perish" may help. The more of us on 10 metres, maybe the less of them. Hopefully they'll just move elsewhere, maybe onto 11 metres. But as there is so many more 11 metre operators than 10 metre Amateurs, it will need a big increase on our behalf to convince the pirates to move off the relatively quiet 10m band.

Another answer is putting CTCSS on our 10m repeater receivers to stop the non-legitimate users, but this will of course effectively stop 95% of the legitimate users as well.

The only way I can see of getting some interference-free enjoyment from this Solar Cycle, is for us all to hop on a central frequency such as 29.120MHz and link our 2m and 70cm repeaters via 10 metre Gateways. If all the Gateways ran both CTCSS encode and decode, to protect our local users from listening to the pirate activity, they would only ever hear the other Gateways and of course any individual HF users who have CTCSS encode on their rigs.

The idea of a number of Gateways in Australia all operating on the same frequency is a great idea. If each VK call area had such a system, all on the same frequency, and linked when propagation allowed, just think ofthe fun that could be had

Setting up a simplex Gateway is that much simpler compared to a duplex repeater. This is not to say we don't still encourage the building and using of 10 metres repeaters inAustralia, but numerous Gateways would certainly be a step in the right direction for getting more users onto 10 metres and hopefully start to push the pirates away.

What to do?

Thank you Robert for the information on the Wollongong 10 metre repeater and the pirate problems on 10 metres. Just what can

we do to make life difficult for the pirate activity on our 10-metre band? Difficult from the point of view of making the band less attractive for pirates. The pirates are here to stay as far as I believe. There is just so much activity that we could not change the situation at all. However perhaps we can salvage some use of the 10-metre band.

In terms of the FM segments on 10 metres, gateway linking offers one small avenue for operation that could make life difficult for pirate activity. As Robert suggested, link VHF/UHF repeaters via 10 metres, and encode the 10 metre links with CTCSS. This greatly limits the effect pirate activity has on the 10 metre linking frequency. 10metres is put to one type of use that is a lot of innovative amateur radio fun, increases activity and hopefully makes life just that little bit more difficult for the illegal operators.

Not Legal

The pirate activity on 10 metres is not legal and neither is linking on 10 metres. Until we change this regulation it is not legal to link repeaters via 10 metres.

How we change this regulation is a frustrating time consuming effort. Having been involved over many years to try and bring about real change in repeater regulations in Australia, all I can say, is there any young keen amateur willing to put in many hours of bureaucratic back and forth? Be prepared for a long tussle over probably many years. If so let me know and I will pass on what I have learnt, perhapsmistakenly learnt, over the years, for what it may be worth.

2000 technology: friend or foe?

When I started to write this month's article I hit the "save as" icon and I typed in the name "jan-00". This is the first time I have used the 00 to represent the year 2000. Having passed my 50th birthday and having been involved in amateur radio since my early twenties, this is an interesting time to reflect on what changes I have seen in this 30 years.

TECHNOLOGY IS the number one change. We operate amateur equipment that was not even thought of, or could be thought of some 30 years ago. Valves still dominated the amateur radio scene 30 years ago. Guessing the future ofamateur radio in terms of the technology is impossible, but digital would appear to be the future.

The declining lack of amateur numbers is one area that we would not have predicted 30 years ago. It was always assumed that our numbers would steadily rise. In fact one reason for having an amateur exam was to restrict numbers, as we all assumed that one day there would just not be enough spectrum space, particularly on our HF bands. We sure got that one wrong. And the surprising point is that technology killed off our numbers. It gave us better radios, but it also gave young people more options in the technology field, and many of these prospective young amateurs moved into computers, the Internet and many other technological activities, but not amateur radio.

> This is rather strange that a technological hobby be threatened in some way by its very technology.

Regulations are the number one little change over the past 30 years.Attitudes have changed somewhat but we are still tied by Government regulators, and I believe to our disadvantage. However I will say the regulatory body, the ACA has changed greatly over the past 30 years. With reduced staff numbers and a more customer focussed direction, the regulator is hardly recognizable from 30 years ago. There is big money and community expectation in spectrum, and the ACA have a big job keeping up with technology and community and business needs.

Amateur radio is way down the list, and as a hobby activity amateur radio can expect little more. But as we have been shunted down the list of importance, what should have changed is the amount and complexity of amateur regulations. We should be self-regulating but we are not. Self-regulation has been talked about but that is all. We are still completely over-regulated and I see little reason to believe it will change. It can actually eventuate that in an attempt to reduce regulation, we actually end up with more. Until a real attempt is made to reduce the complexity of regulation in the amateur service, amateur radio will suffer. Voice repeaters regulations reflect this situation and we seem largely powerless to bring about change, real change, not just increase the number of allowed repeaters from 3 to 4, but real change, meaning no limit.

In conclusion the year 2000 is just another year. But it is an interesting number that provides a point of reference and thought about amateur radio past and present. I have seen incredible changes in technology, but in some ways to the detriment of amateur radio. This is rather strange that a technological hobby be threatened in some way by its very technology. Being able to talk to someone across town or on the other side of the World has no where near the awe it did 30 years ago. People of all ages, and in particular the young, do it at the click of a mouse button on the Internet. What will amateur radio be like in 30 years from now? Will we still have the same limiting voice repeater regulations we havetoday? Voice repeaters started in Australia a little over 30 years ago, will there still be voice repeaters, as we know them 30 years from now?

These are some of my thoughts for the year 2000 and amateur radio.

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Amateur Radio
Supporting the community

Bill Magnussen VK3JT
RMB 1627 Milawa Vic. 3678 Email: vk3jt@amsat.org

Currently Operational Amateur Radio Satellites

THIS LIST is compiled from a variety of sources with a high reliance on AMSAT News Service bulletins as well as personal operating experience and information gleaned from discussions on the AMSAT-VK net and the AMSAT-NA bulletin board on the Internet. It is as comprehensive and up to date as copy deadline dates will allow. A good source of up to the minute information is the AMSAT world-wide-web site. Due to the dynamic nature of the amateur radio satellite scene, readers are urged to check all information against this source, particularly if tooling-up for new satellites, modes or frequencies. The list is updated in this column twice each year in January and in July. Its purpose is to assist those who may not have access to more immediate sources of information.

RS-13

Uplink 21.260 to 21.300 MHz CW/SSB
Uplink 145.960 to 146.000 MHz CW/SSB
Downlink 29.460 to 29.500 MHz CW/SSB
Downlink 145.960 to 146.000 MHz CW/SSB
Beacon 29.458 MHz
Robot Uplink 145.840 MHz
Robot Downlink 29.504 MHz
Operational, in mode-KA with a 10-metre downlinkand a 15-metre and 2-metre uplink.

For some months the RS-13 transponder has been acting in an unpredictable fashion. Early in December the situation improved and at last reports it had returned to normal operation.

RS-15

Uplink 145.858 to 145.898 MHz CW/SSB
Downlink 29.354 to 29.394 MHz CW/SSB
Beacon 29.352 MHz (intermittent)
SSB meeting frequency 29.380 MHz (unofficial)
Semi-operational, mode-A, using a 2-metre uplink and a 10-metre downlink.

AO-10

Uplink 435.030 to 435.180 MHz CW/LSB
Downlink 145.975 to 145.825 MHz CW/USB
Beacon 145.810 MHz (unmodulated carrier)
Semi-operational, mode-B.

AO-10 has been locked into a 70-cm uplink and a 2-metre downlink for several years and can be used when the beacon signal is NOT FM-ing. Signal throughput can be very strong when the satellite is close in, but it can be frustrating to battle the deep fades and low signal strength when it is out around apogee.

AO-27

Uplink 145.850 MHz FM
Downlink 436.795 MHz FM
Operational, mode J.

AO-27 uses a method called Timed Eclipse Power Regulation (TEPR) to regulate the on-board batteries. In simple terms, TEPR times how long the satellite has been in an eclipse (or in the sun) and decides what subsystems to turn on or off. I have still not received any reports of AO-27 being turned on over Australia.

FO-20

Uplink 145.900 to 146.000 MHz CW/LSB
Downlink 435.800 to 435.900 MHz CW/USB
Operational. FO-20 is in mode JA continuously.

FO-29

Voice/CW Mode JA
Uplink 145.900 to 146.000 MHz CW/LSB
Downlink 435.800 to 435.900 MHz CW/USB
Semi-operational, rotated with digital mode and digi-talker.

Digital Mode JD

Uplink 145.850 145.870 145.910 MHz FM
Downlink 435.910 MHz FM 9600 baud BPSK
Digitalker 435.910 MHz

Semi-operational, rotated with analog mode and digi-talker. The transponder schedule is likely to change with too short notice to print any meaningful data here.

National co-ordinator:
Graham Ratcliff VK5AGR
Email: vk5agr@amsat.org

AMSAT Australia net:
The AMSAT-Australia net is held on 80 or 40 meters LSB (Lower Side Band) each Sunday evening (except over the Christmas/New Year period). During the winter months in South Australia (end of March until the end of October) the net is on 3.685 MHz +/- QRM with an official start time 10.00 UTC with early check-ins at 09.45 UTC.
During the summer months when daylight saving is in operation in South Australia (end of October until end of March) the net is on 7.068 MHz +/- QRM with an official start time of 09.00 UTC with early check-ins at 08.45 UTC. The times and frequencies have been chosen as the best compromise for an Australia-wide net taking into consideration seasonal propagation changes and the various state summer time variations.

AMSAT Australia newsletter and software service:
The newsletter is published monthly by Graham VK5AGR. Subscription is $30 for Australia, $35 for New Zealand and $40 for other countries by AIRMAIL. It is payable to AMSAT Australia addressed as follows:
AMSAT Australia
GPO Box 2141
Adelaide SA 5001

Keplerian Elements.
Current keps are available from the Internet by accessing the AMSAT FTP site, ftp.amsat.org and following the sub-directories to "KEPS".

KO-23

Uplink 145.900 MHz FM 9600 baud FSK
Downlink 435.175 MHz FM

Non-operational at the time of writing. This could change at any time however as we have enjoyed periods of re-activation by the control stations as battery conditions allow.

KO-25

Uplink 145.980 MHz FM 9600 baud FSK
Downlink 436.500 MHz FM

Operational and carrying the main load of 9600 baud BBS traffic.

UO-22

Uplink 145.900or145.975 MHz FM 9600baud FSK
Downlink 435.120 MHz FM

Operational and carrying the main load of satgate traffic with quite a lot of BBS traffic as well since KO-23 has been unreliable.

UO-11

Downlink 145.825 MHz FM, 1200 baud AFSK
Mode-S Beacon 2401.500 MHz

Operational.

The operating schedule is unchanged.

ASCII status (210 seconds)
ASCII bulletin (60 seconds)
BINARY SEU record (30 seconds)
ASCII TLM frames (90 seconds)
ASCII WOD whole-orbit-data (120 seconds)
ASCII bulletin (60 seconds)
BINARY ENG data (30 seconds)

The ASCII bulletin is currently a static message, detailing modes and frequencies of all active amateur radio satellites.

AO-16

Uplink 145.90 145.92 145.94 145.86 MHz FM using 1200 baud Manchester FSK
Downlink 437.0513 MHz SSB RC-BPSK 1200 baud PSK
Mode-S Beacon 2401.1428 MHz

Operational but the beacon is sometimes turned off.

AO-16 has operated continuously for over 1,800 days since its last software reload.

LO-19

Uplink 145.84 145.86 145.88 145.90 MHz FM using 1200 baud Manchester FSK
Downlink 437.125 MHz SSB RC-BPSK 1200 baud PSK

Currently semi-operational. No BBS service. The digipeater is active.

TO-31

Uplink 145.925 MHz 9600 baud FSK
Downlink 436.925 MHz 9600 baud FSK

Operational

ProcMail V2.00G has been released by G7UPN. This software permits the processing of image files from TO-31. It has been posted to the AMSAT-NA FTP site.

PO-34

New technology satellite using spread-spectrum techniques. It has not yet been fully commissioned.

SO-35

Semi-operational to a published schedule, usually a month ahead. SunSat has been in mode-B using an uplink of 436.291 MHz (+/- doppler) and a 145.825 MHz downlink. Many stations can be heard at week-ends working via SunSat. Although some mobile and hand-held portable contacts have been made, those who do best are stations equipped with auto-track antennas and auto-doppler compensation. The doppler compensation is particularly important on the 70cm uplink.

UO-36

Downlinks
437.025 MHz
437.400 MHz

UO-36 carries a number of imaging payloads, digital store-and-forward communications and mode L/S transponders. The satellite is not currently available for general uplink transmissions. S-band high speed downlink commissioning continues at rates between 128kb/s and 1Mb/s. The S-band downlink frequency has not been announced. The VK5HI/TMSAT viewer shareware is available on the AMSAT-NA web site.

IO-26

Uplink 145.875 145.900 145.925 145.950 MHz FM 1200 baud
Downlink 435.822 MHz SSB
Semi-operational, digipeater function is 'on'.

GO-32

Downlink 435.225 MHz using HDLC telemetry.

GO-32 is still undergoing tests prior to being opened for general use.

MIR Space Station

Ham radio activity aboard the Mir space station came to a close on August 28, 1999 as the crew returned to Earth, leaving the station unmanned. The date for re-manning of MIR keeps slipping forward and the reports as to re-activation of the amateur radio equipment also seem to change from time to time. Keep watching as the current reports indicate that there may be a short period of activity around May before MIR is sent down into the Pacific Ocean.

Using Instant*Track* (version 1) into the new Millennium.

The version 1 edition of the InstantTrack program had for a long time been assumed to be incompatible with dates from 2000 onwards. In fact the program itself is quite compatible. A problem does arise however when loading kep elements with "00" in the year field and NASA had for some time signaled its intention to adopt that date format into the new millennium. A rather clever way out of this situation emerged late in 1999. John, F6HCC produced a utility program based on a "kep-converter" utility that had been around for some time. The kep converter, called 2LIN2KEP.BAS was originally written in basic by G3RWL. It took a set of kep elements in NASA format and converted them into AMSAT format. Some folks, indeed some software preferred this verbose format where all the individual elements could be read as text so their real values were much more apparent than in NASA format. John's clever idea was to take this utility and include some code, which would add 100 to the year field. In this way InstantTrack would read the year as progressing from 19-ninety-nine to 19-one-hundred which of course is in effect 2000. Most people will have caught up with this utility by now but if you want a copy, contact Graham vk5agr at the AMSAT-VK address above. Please send either a formatted 1.44 Mb floppy and return postage or sufficient donation to cover copying and return mailing. The utility is called 2L2ITKE.EXE. At the time of writing we are all still eagerly awaiting the new version 1.5 of InstantTrack which will include a new range of features and of course will be 2000 compatible.

Amateur Radio Pico-Satellites launch delay

The October launch date for JAWSAT stretched out to December and at the time of writing stands at late January. When launched, JAWSAT will separate into two smaller packages, ASUSAT and OPAL. Then two amateur radio pico-satellites will separate from OPAL to become StenSat and MSAT-1. These incredibly small devices are about the size of a packet TNC and could easily point the way to the future of low-cost amateur satellite packages. Those stations equipped for the 9600 baud digital birds will be able to take part in the ASUSAT experiment by copying telemetry from the new satellite after launch and sending it to the control teams for analysis. This entire project is a joint effort involving 3 American universities.

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ARDF

Ron Graham VK4BRG
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ARDF or anti-ARDF?...That is the question.

OVER THE LAST FEW MONTHS I have been experimenting with what could be considered anti-ARDF. Instead of having to find the location of a hidden transmitter, this system "tells" the location of its associated transmitter. This system is called Automatic Position Reporting System (APRS). Amateurs are using it, principally, to indicate the position of their home station or their mobile. Commercial usage is abundant with some examples being indicating the position of emergency vehicles, tracking valuable cargo and stolen vehicles, monitoring the positions of marine buoys, in the later generation of emergency beacons (thus enabling them to be found more quickly), even in the loco's hauling sugar cane in this area, etc.

What is APRS?

APRS is a system that automatically transmits, at pre-determined intervals, a (generally moving) object's position. That position may be received by an APRS equipped station, which on its computer screen is displaying a map of the area of interest. The transmitting station's position is indicated on that map together with information to identify that particular station. Naturally, the system can display the position of a large number of transmitting stations (objects) at the one time.

Thus one should be able to relate how APRS is used in the applications mentioned above, plus, hopefully envisage some other applications that could benefit the amateur radio fraternity.

Personnel on the moving object (or vehicle) may, with normally a lap top computer, also view a map showing their own position and the positions of the other participating stations. This is another application in addition to the home based central location.

Equipment needed

Transmitting Station

The position is normally derived from a GPS receiver. That digital positional information (normally in NMEA format) is fed into an interface unit which converts it into audio tones .. actually standard 1200 baud AX25 packet. The audio is fed into a suitable transmitter and the information broadcast as unconnected UI packet information to all stations.

Thus one needs a suitable GPS, interface unit and transmitter.

Receiving Station

This consists of a suitable receiver feeding audio into a standard packet TNC. The digital signal from the TNC is fed to a computer that is running an APRS programme. That program accesses the map of interest and is capable of manipulating maps in various ways. Zoom in/out, read off bearings and distances between selected points etc. It also converts the data from the TNC into positional and identifying information that appears on the map.

Here, one needs a suitable receiver, TNC and APRS programme running on a computer.

Of course, there are many ways that APRS can be set up and with different equipment involved. For example, the interface unit, mentioned as a transmitting requirement, could be replaced with a dual port computer: one port for the GPS and the other for the radio.

Amateur Applications?

I suppose we should put our heads together to try and determine further suitable applications for APRS : particularly those that could further our cause with public related activities. Possibly, these could be divided into:

a) Sport related : such as marathons, car rallies, horse endurance events, boating etc.

b) Emergency related : such as WICEN and SES involvement.

The present "state of the art" amateur APRS tracking equipment is that it is still reasonably large, heavy and power hungry. This, in my opinion, limits the applications to equipment installed in various vehicles where the above criteria are acceptable. This needn't limit applications with say marathon/horse endurance type events, for example, as the equipment could be placed in participating vehicles or at checkpoints.

As equipment is further miniaturised, and this is really just a matter of costs, APRS tracking equipment will be able to be carried by persons participating in various events. Quite low power transmitters would be used, so digipeaters would need to be placed in the area to relay the data to a central point.

Benefits

Having sporting or emergency type events covered by APRS with participant's positions being nicely displayed on a map should appeal to organizers. It should be worth a lot of PR, allowing them to explain (and actually show others) what is happening. With participants positions being shown on a map, it is just so much easier to have an overview of the situation.

Maps

Naturally, a map of the area of interest, at a suitable scale, is required. Some maps are currently available and some types of paper maps may be scanned and used. More and more parts of this country and cities are becoming available on CD's, though as these are commercial enterprises, prices are often high.

More Information

Darryl, VK2TDS, has promoted APRS in Australia and New Zealand by giving talks at a number of clubs. He has a CD available for a nominal cost of $10. The CD contains heaps of general APRS information, APRS programmes, Australian maps etc. Darryl may be contacted at PO Box 169, Ingleburn, 2565.

I have cloned a device that is popular in the US where it is called PIC-E. That TAPR device was, I think, derived from their MIC-E (microphone encoder). Both those devices and my clone form the necessary interface between a GPS and a transceiver.

Recently, there became available a number of surplus US$20 GPS receivers. Unfortunately the source is now depleted, but quite a few found their way into amateurs hands. This prompted me to re-design my PC board to accommodate that receiver and a necessary data conversion chip. So this integrated unit only needs a transceiver to form an APRS tracking unit.

It is planned to try and fit the above unit into the popular Philips FM-828 transceiver and thus end up with a completely integrated APRS tracker with reasonable power output. It would only need the GPS antenna, a 2 metre antenna and a 12 volt power source to form that complete tracker.

Divisional Notes

VK2 Notes

by Pat Leeper VK2JPA
patleep@bigpond.com

This has been another successful year for the VK2 Division with 97 new members for the year, including 11 applications to be tabled at the December meeting (not yet held at time of writing).

An innovation taken up by the Division has been the VK2DQ Internet theory course which is being supervised by Barry White VK2AAB. This is in addition to the Correspondence course and both of these would now seem to cover all fields. Let's hope it brings more amateurs to our hobby — we need them! Many youngsters are apparently already finding the Internet boring and may be ready to go on to other interests — keep pushing Amateur Radio to them!

It has been decided the special Olympic Games callsign be activated for special days this year, and for a period of 4 weeks prior to the Olympic Games and 5 weeks after the Paralympics. The prefix during the actual Games' period is expected to be AX.

Council is looking into costs of posting QSL cards as the recent postal price hike has hit this service to the members. It may be necessary to make a small charge on outgoing cards. Further information will be made available as it comes to hand.

In General Business, Council discussed the impact on HF transmissions of the proposed high speed data over telephone lines to be used for Internet access. Each transmission method can corrupt the other as telephone lines are unshielded. If this is allowed to to be used here, HF radio could be on the way out. This matter needs to be brought up with the A.C.A.

There will be no Council meeting in January.

Members are reminded that the Annual General Meeting of the VK2 Division will be held on Saturday 15th April at Amateur Radio House Parramatta. Nominations for Council and Motions on Notice close on Saturday 4th March at 12 noon at the office at Amateur Radio House, 109 Wigram Street, Parramatta.

The first examinations for 2000 will be on Sunday 20th February, with applications closing on Thursday 10th February. Applications forms are available from the VK2 office.

The Affiliated Clubs Conference was held on 13th November with a good roll-up. There were eighteen clubs represented by 1 or 2 delegates, along with the VK2 Councillors, Peter Naish VK2BPN (Federal President), Tony Farrow VK2TJF (Federal Director and WICEN delegate), Glenn Dunstan VK1XX (VK1 Federal Councillor), and Guest Speakers including Bill Vlies (ACA), Col Christiansen VK2BCC (ACA), Peter Jensen VK2AQJ. After Peter Naish VK2BPN had addressed the meeting, a number of subjects were discussed, including the Y2K problem and the effect of the GST. Peter said the Y2K compliancy will be ready when needed, and a GST component will be added to the Federal portion of membership fees from 1st January 2000. As each Division is autonomous, each will have to assess the impact of that on their portion of the membership fees.

Peter asked for more articles for AR, especially in the experimental areas of VLF and microwave bands to show the results of the experimentation that is going on there.

Peter Jensen VK2AQJ gave a talk on his recent trip to the U.K., mentioning that they are facing much the same problems as we have here — ageing membership, falling numbers, encroachment by the Internet. However, he found that one of the clubs he visited has gained young members by concentrating on the digital side of Amateur Radio, with computers, modems and radios. He also spoke on the new mode of PSK31 which is very popular in the U.K

There was discussion on a possible special 2-metre repeater for use by visiting amateurs during the Games, which would have to be outside the local repeater allocation to cater for overseas handhelds. Handhelds, either local or overseas, will not be able to be taken onto Olympic sites as all equipment must be authorised. If a handheld is taken on-site and causes interference, it will be confiscated.

In-band and off-air linking was also discussed, and this needs a professional proposal to be drawn up before it can be placed before the ACA.

Bill Vlies answered questions on various subjects. One interesting answer he gave to a question on pager interference was — the only thing amateurs can do is come up with the technology to beat it!

There was much more general discussion and this can be read in the minutes that are sent out to the affiliated clubs following the conference. All present had an enjoyable and interesting day and many hoped to be back for the next one.

This will be on Saturday 6th May 2000, so mark it down in your new diary.

That's all for this month from the VK2 Division.

The Affiliated Clubs Conference

VK1 Notes

By Peter Kloppenburg VK1CPK

Forward Bias

As most of us are aware by now, A Novice course is starting on February 2, 2000 at the Hughes Community Centre, Wisdom St, Hughes. Course duration is 24 weeks.

At appropriate times during the course, excursions will be arranged to hamshacks of established amateurs (Mentors or in AR terms "Elmers") for practical demonstrations of radio equipment and on-air operations. These excursions will take place on weekends coincident with good propagation conditions. Some practical demonstrations will also be conducted during class hours using simple test equipment and electronic components such as voltmeters, batteries, light emitting diodes, and resistors among others. Another study component is **Regulations**. These rules of on-air operations are non-technical and can therefore be learned at home. However, parts of the regulations will be dealt with during classes, to better familiarise students with the terminology used in the world of amateur radio operations. **Morse** tuition will be offered if one of our fellow amateurs offers half an hour of his time to bring students up to speed. An information Evening was held at the Community Centre on October 24, that successfully provided prospective students with details of the course. Another such evening is scheduled for January 26 at the same place. By the time of the Annual General Meeting (AGM), the Novice course should be in full swing. Are you coming to the AGM? If you do, you get a free cuppa, an annual report from the President, and a view towards the future of Amateur Radio. In addition to all this, you'll get an opportunity to join the committee and make it happen.

The next General Meeting will be held at Room 2, Griffin Centre, Civic, Canberra, on January 24, 2000. See you there.

VK4 Notes

QNEWS

by Alistair Elrick VK4FTL
WIAQ Councilor and QTC Editor

Amateur Radio Sunday Funday 2000

Caboolture Super Club will host this event and the date will be February 20. (That's the weekend prior to Gosford Field Day). Contests, Rag Chewing, Fun and Food will be the order of the day. Funday organiser, VK4BB Brian Beamish, says he's looking forward to working with the Caboolture President Mark, VK4VG and his team at this, the second annual Amateur Radio Sunday Funday.

Camping facilities at the local Scout site for $3 per person per night has been arranged. The site offers room for many tents, caravans and camper trailers, as well as a 13-bed dormitory style accommodation building and a large hall with full cooking facilities. All conveniences toilets and showers etc are available also, all within an easy 10 minute drive from the Funday site.

The FUNDAY 2000 site has shelter and toilets, with a playing area for children, and there is no shortage of parking. Maybe your club would like to provide a demo or input into the day? If so contact Brian VK4BBS. It's a Fun Day so do plan to come along on the 20th February and enjoy. As last year a Gold Coin donation from those attending, with all money raised going to the Royal Flying Doctor Service.

(Brian VK4BBS Funday Organiser)

QTC Magazine

Now available as a direct e-mail feed. Subscribe from the instructions on our website; remember to also send an e-mail to VK4JPH to give your call, e-mail address and your membership details.

Recently Peter VK4JPH and a 'friend' brought the WIAQ front page up to date, with several improvements. Peter no doubt has learned a great deal from this 'friend' reputedly a professional web designer.

Summerland AR Club (VK2)

Phil VK2YGF from the Summerland AR Club made a rebroadcast of QNEWS using the RealAudio files from the WIAQ web site. It was reported as very good quality audio with no sign of metallic or echo effects. A great way to get your feed of Qnews for broadcast anytime to suit the local requirements. The SARC web page is at http://www.nor.com.au/community/sarc/sarc.htm or look on page 926 on the national packet teletext system of your BBS.

University Of The Third Age

But I hear you ask what is this U3A?

Well it was founded by Olive McKee in 1987 and has members on the Redcliffe Peninsula and surrounding areas, and a sub-branch in Caboolture.

A person of the Third Age is in retirement or has completed the responsibilities of parenthood. The Third Age is the part in one's adult life when one has the time to devote to interests other than earning a living and raising a family. In other words, there are no age limitations. Since all teaching is voluntary, costs of courses can be kept to an absolute minimum.

Contact the University of the 3rd. Age (U3A) via the Redcliffe Radio & Communications Group to learn all aspects of Amateur Radio.

AOCP classes are on Tuesdays 10.00 AM - 12 noon.

Just phone Kevin VK4AKI on 3880 1112 or kevjon @ bit.net.au

Townsville to the Azores - on Six Metres!

With the current solar cycle lurching headlong to its peak around the middle of next year, six metres - "the magic band" - is putting its best DX performance for a decade.

VK4ABW in Townsville worked CU7DRY in the Azores, off North West Africa, earlier this week - a distance of 17,806 km, according to the figuring of Neville, VK2QF. Not a bad effort, but still about 2000 km shy of the 6m DX record held by Mike, VK2FLR.

New Harmonic

We were all pleased to learn of an additional harmonic in the household of Laurie VK4BLE the WIAQ QSL Bureau Manager. Wife Alison VK4HAD gave birth to a little girl, Stephanie Kate on 30-11 99, a sister to Emily and Daniel. Well done and congratulations from all the Amateur fraternity.

Well this is the first AR edition for the year 2000 and I hope all survived the celebrations. Think about your Division of the Wireless Institute of Australia and what you can contribute for the benefit of your fellow members, by actively participating in the Councils and their support activities.

73's from Alistair

VK6 Notes

Chris VK6BIK
chrismor@avon.net.au

And so forward to a new era in amateur radio with the approaching launch of the Phase 3D satellite. Out with the old, in with the new ! I predict that this more "user friendly" satellite will, over a couple of years, decisively shift the emphasis in amateur radio to the higher bands, and bring more younger people into the hobby. We shall see.

Cockatoo'ed in Toodyay. To the relief perhaps of some, the tower is down, I'm off the air completely, and will struggle to get back, especially as I am contemplating moving interstate early in the new year. The large (chook size) white parrots have slam-dunked my entire antenna array (HF, 6m, 2m, 70cm), chewing through my defenses of retic plastic pipe to get at the co-axe cable and antenna feed points, baluns etc.. I woke up early one morning due to the screeching and squabbling noises to find about a hundred of these destructive monsters fighting over the juiciest co-axe ! There are many advantages for Ham radio when living in the country (eg: room for antenna farms, use of linears, quietness, etc..), but also obviously some major disadvantages as well. If planning a move to the country, choose your location wisely !

Operating. I was struck recently by the apparent fact that most of the hams working at the leading edge (vhf/uhf/microwave) of amateur technology, are pensioners! Who will replace them when they fall off the perch? Hence my hopes for P3D. The country linked-repeater system centered on VK6RUF has started to open solidly again, with good propagation extending it's usefulness into outlying areas. I find VK6RMS (147.250 rx) on Mt. Saddleback at Boddington the most reliable access point from my qth in Toodyay (distance about 150 kms). I am pleased to report that another experimenter who has come to weak-signal sideband work late in life, Conn VK6PM (Toodyay), has been working Bill VK6AS (Esperance) on 2m CW and SSB. Conn uses a small 8 element yagi at a height of 23 ft, no pre-amp, and just 10 watts – so this is quite an achievement for a modest station as the distance between stations is 580 km. Of course, Bill's outstanding 2m installation (hopefully there will have been a pic of this published somewhere in the last issue), would have been doing much of the work, but it does show what can be done without depending entirely on ducting.

CW Survey – Final Results (obtained on 10/12/99 from the internet)

CW Retention/Abolition survey. YES (i.e. keep cw as an exam requirement, even if at reduced speed) = 125; NO (i.e. don't keep) = 147. So victory for the NO's, and surely a clear mandate from VK6 amateurs for the WIA to proceed accordingly in it's dealings with the ACA and other regulatory bodies? (see also item below under General Business).

From the Minutes (Dec. Council Meeting). Some items of interest:

Membership: Dave VK6IW had received five new applications for membership. They are: David Lloyd VK6AOM, Glen Thurston VK6ZGT, Patricia Dicks VK6QL, Luigi Iemi VK6YEH, and Peter Harvord VK6BRN. All were warmly welcomed to the Division (Dave 6IW/Eddie 6ZSE). "Mac" Maguire VK6MG aged 95 and a member of the WIA since 1929, was to be recommended to the next AGM to be granted Honorary Life Membership of the Division in recognition of 70 continuous years as a member of the Division. Broadcast: Tony VK6TS asked whether the monthly on-air meeting should continue. It was agreed that it was worthwhile to do so. The next net will be at 2000 hours (changed from 1930) on Tuesday 18th January 2000. QSL Bureau: Neil VK6NE reported the rise in postage rates had placed Bureau operations at a critical phase. While VK6 operations were holding their own, it may be necessary to adopt a National Bureau only at some future time, if the QSL Bureau system is to remain viable. General Business: Cliff VK6LZ advised Council that the proposal for commercial redevelopment of the Tick Hill repeater site had been dropped. The Morse survey was discussed. Will VK6UU will examine the results and provide some statistics for a future meeting. Dave 6IW advised that he anticipated that he would not wish to carry on in the office of Membership Secretary after the 2000 AGM.

Please note that as I will be away in Africa during January, there will be no Notes for the Feb issue, unless a volunteer steps forward. Also, I am seriously considering a move to the East Coast, and will be going over to VK4 to check things out soon. I have enjoyed compiling the monthly notes (and, some would rightly say, ramblings), but we may be looking for a new correspondent from Feb 2000. If you would like to give it a go, please contact the Secretary, Christine VK6ZLZ.

Happy New Year, I hope the Y2K bug didn't bite, and 73 from Toodyay, Chris VK6BIK

VK7 Notes

by Ron Churcher, VK7RN.

By the time you read this all the rip-roaring rush and tear about of the Christmas Season will be gone and most of us will have sat back and asked ourselves. "Why do we do it every year?" At any rate I hope that your festivities were all that you would want them to be.

Let me first on behalf of the Tasmanian Division wish our new editor, Colwyn Low a happy time in the job and thank Bob Harper for his work during his time as editor, not forgetting our old friend Bill Rice as well. We have some good people in amateur radio.

December was a pretty lively time in Tasmanian amateur radio circles with the end of the year functions. The "sewing circle" barbecue at the QTH of Bill Donald VK7AAW at Forcett near Hobart is always well attended. Incidentally Bill reckons he's got the only 4 letter suffix in Australia (Get it??).

The Christmas dinner at Ulverstone for the Northwest branch saw the annually presented "Joan Fudge award" won this year by Terry Ives , VK7ZTI, our treasurer. This award is a fine perpetual trophy in honor of a lovely lady - our first female amateur from this area and our secretary for some years. It recognises outstanding service for the branch.

A fine misty rain, which set in about an hour after the barbecue fires were lit, failed to dampen the spirits of the northern branch members at their Myrtle Park year-end barbecue. The big excitement of the evening was when Joe Gelston, VK7JG hauls in two trout from the St. Patrick's River which winds through the park. One was a beauty but Joe was miffed when we made him send the other tiddley back to its Mummy.

The Division is in the process of looking for another Home Page address as our present one has upped his charges. As soon as we can we will notify the Federal Home page - in the meantime if you want news from the Island State go in through the link on the Federal page.

Just a note to remind all our members that the annual meetings are fast approaching and we must be looking for Councilors for the next 12months. I have already intimated that I feel that after three years it's time for a presidential change and so I will be stepping down as President at those meetings.

Cheers for now. Ron Churcher, VK7RN.

ar

RF Radiation Hazard

VK3ZED's 'haste and anger' (AR, Over to You, November 1999) suggests a rather naive knowledge of RF power, antenna gain and associated power density or field strength, particularly of microwaves.

His scoffing of the heating potential of microwave RF power focussed with a parabolic dish antenna suggests a poor understanding of the achievable concentration of RF field strength compared with the same source of power radiated omnidirectionally. The hazard to human tissue (and pigeons!) of remaining, for even short periods of time, within the RF field of the main beam of a radiating microwave dish antenna is not easily perceived by those unfamiliar with microwaves. The vulnerability of soft tissue such as the brain and eyes cannot be underestimated.

I would have thought that the simple school physics demonstration of sunlight through a magnifying glass is evidence of how gain (optical, in this case) can be applied to electromagnetic waves to increase their power density to potentially dangerous levels. The gain is certainly effective...and the results real!!

Phil Smith VK1GZ

More Info on "Kestrel"

I have read small articles in this and last month's magazines about the yacht "Kestrel'.

If you want further information about Noel Toohey and his yacht there is a net which was formed by that gentleman and a few of his friends many years ago called not surprisingly "The Kestrel Net".

It is held on 3.600 at around 09.00 Zulu and I think it is still going, although some of the members have become silent keys. Some of the regulars are VK2AYG, VK2UI and VK2GWE.

I believe the former owner of my callsign was also a member. I used to be on the net some 10 years ago and they used to contact Noel from time to time on his way around the Pacific.

Kevin Mulcahy VK2CE

Future of VNG

The news items in pages 3 and 34 of October *AR* concerning the Standard Time and Frequency station is a timely warning from Ron VK3AFW. After reading this item I would like to add my own warning on this matter and a warning to all Amateur Operators in general, along strong political lines. We all want amateur radio to continue and grow in spite of the Internet etc.

To accomplish this we must all become a strong political lobby, despite personal opinions. The neutrality tightrope is obsolete. Conservative governments are the servants of the big end of town. Their expressed concern for people is a veneer, while 'non- conservatives' have been political pariahs since the early 1970s.

Both major political parties have engaged in asset stripping of the people. Downsizing and privatising have been and are an absolute disaster, sending the cost of goods and services sky high. It is therefore necessary for all of us to campaign and lobby all politicians to have this or a future government buy up, buy back or buy out the contract concerning Station VNG!

Station VNG can be and must be a fully publicly owned asset. Sir, having been a political analyst for many years, I very strongly urge you to put these views before all Amateur Operators, to write or fax all politicians and the VNG User's Consortium. Your local member will buckle under the weight of hundreds of letters and faxes etc. While sitting at the keyboard would be a good time to also make your feelings and voice heard loud and clear that all of the amateur bands and frequencies can and must be preserved for your use only and positively NOT for private vested interests.

The radio frequency spectrum is a natural God-given asset of the people. It is wide enough for all to use, but absolutely nobody has any right to monopolise any section of the spectrum. Therefore, to maintain our hobby, do not sit on your hands, but let us all start lobbying and campaigning for Station VNG and our hobby in general

M M Gell VK5ZLC
3/18 Brighton Road Glenelg SA 5045

This letter reflects the views of its author only, and not necessarily those of the WIA. Institute policy is expressed only in official WIA Council statements.

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Ionospheric Update	Evan Jarman VK3ANI	Nov	51
RECEIVERS			
An Attenuation Set for Receiver Sensitivity Measurements	Drew Diamond VK3XU	Aug	22
Biaural Direct-conversion receiver	Drew Diamond VK3XU	Sep	24
The 'Moorabbin' a Simple Regenerative AM Receiver	Peter Parker VK3YE	Nov	32
Receive SSB on your FM Receiver	Peter Parker VK1PK	Mar	18
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REPEATERS AND BEACONS			
Letter re 29MHz Repeaters	Repeater Link	Oct	38
Teletext – The Silent Revolution	Gerard VK2DAA	Nov	37
TEST EQUIPMENT			
A Spectrum/Attenuation Measuring Set	Drew Diamond VK3XU	Dec	24
An Inductance Meter for Radio Coils	Drew Diamond VK3XU	Feb	12
An RF Attenuator	Keith Gooly VK5OQ	Nov	30
HF-MT Dummy Load	Ross Fraiser VK2KVV	Feb	20
K2 Transceiver	Adrian Hatherley VK3LK	Oct	21
Return Loss Bridge (RLB)	Ron Saunders VK2WB	Oct	24
160 meter Band Pass Filter	Keith Gooley VK5OQ	Feb	14
TRANSMITTERS			
A Homebrew 813 Linear Amplifier Part 1	C. J. Bourke VK4YE	Mar	7
A Homebrew 813 Linear Amplifier Part 2	C. J. Bourke VK4YE	Apl	12
A Simple QRP Transmitter	Pounding Brass	May	33
An AM/CW Transmitter for 1.8,3.5 and 7 MHz	Drew Diamond VK3XU	Dec	30
WRITING ARTICLES			
How to write for Amateur Radio	John Nieman	Jan	26
Taking Photos for Amateur Radio	Bob Harper VK4KHN	Apr	22

ar

HF PREDICTIONS

by Evan Jarman VK3ANI
34 Alandale Court, Blackburn Vic 3130

These graphs show the predicted diurnal variation of key frequencies for the nominated circuits. These frequencies as identified in the legend are:-

- **Upper Decile (F-layer)**
- **F-layer Maximum Useable Frequency**
- **E-layer Maximum Useable Frequency**
- **Optimum Working Frequency (F-layer)**
- **Absorption Limiting Frequency (D region)**

Shown hourly are the highest frequency amateur bands in ranges between these key frequencies; when useable. The path, propagation mode and Australian terminal bearing are also given for each circuit.

These predictions were made with the Ionospheric Prediction Service program: ASAPS version 4.

January 2000
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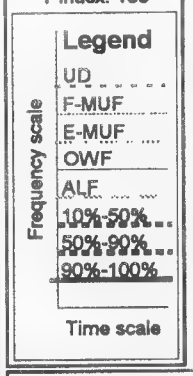
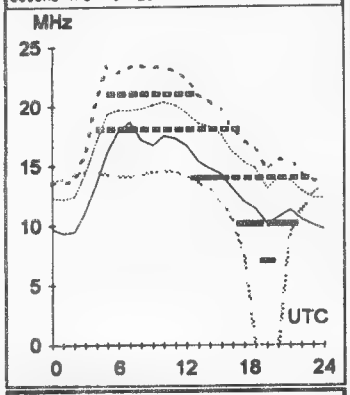
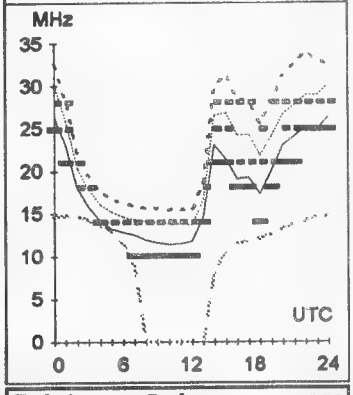


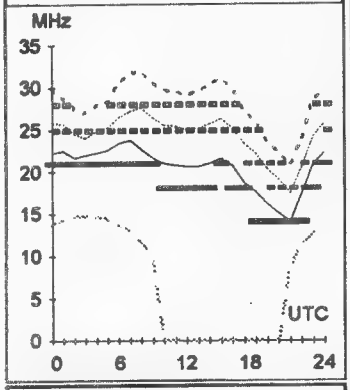
Adelaide-Capetown 226
Second 4F5-15 4E0 Short 10154 km



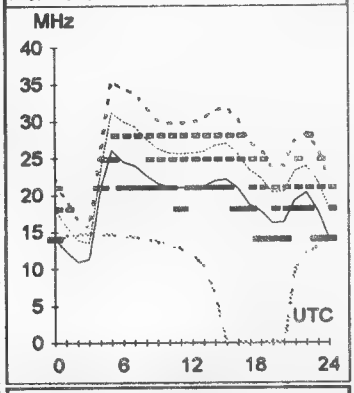
Brisbane-Boston 56
First F 0-5 Short 15722 km



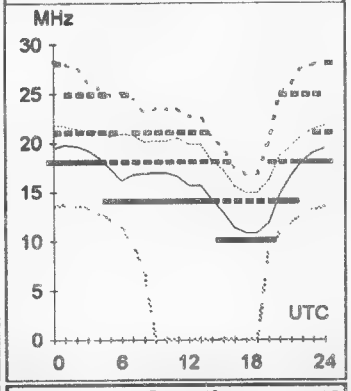
Adelaide-Manila 338
First 2F3-12 2E0 Short 5813 km



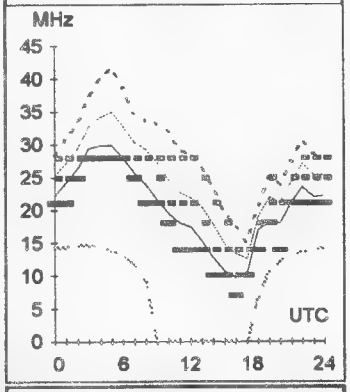
Brisbane-Cairo 288
First F 0-5 Short 14391 km



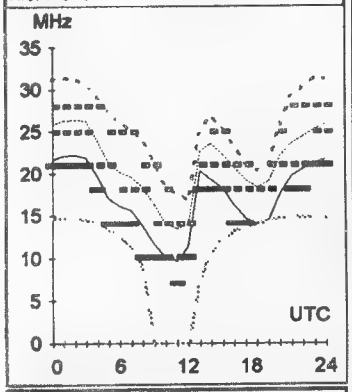
Canberra-Auckland 102
First 1F7-14 1E0 Short 2300 km



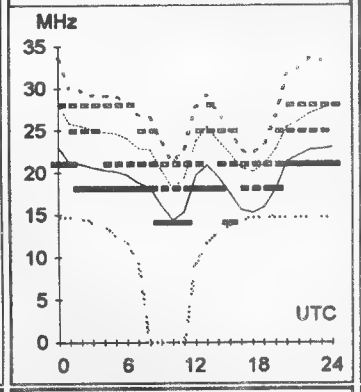
Darwin-Honolulu 65
First 3F 3-11 3E0 Short 8636 km



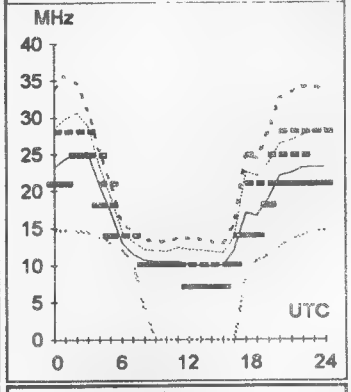
Adelaide-Miami 95
First F 0-5 Short 16175 km



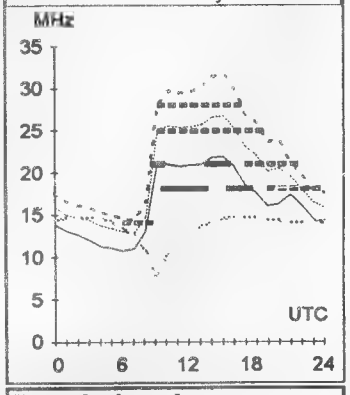
Brisbane-Lima 122
First F 0-5 Short 13056 km



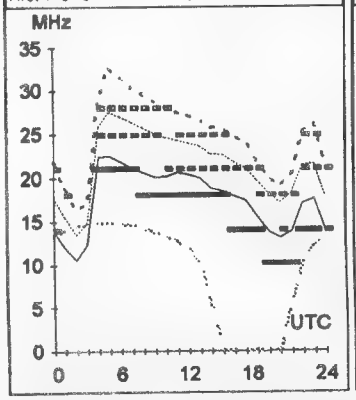
Canberra-Seattle 48
First F 0-5 Short 12709 km



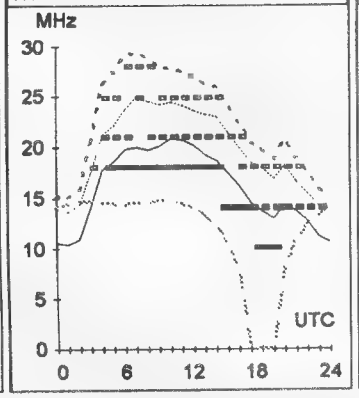
Darwin-London 145
First F 0-5 Long 26170 km



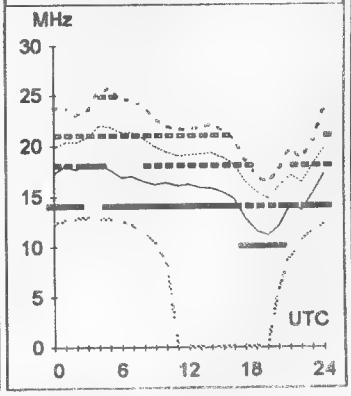
Adelaide-Tel Aviv 291
First F 0-5 Short 13126 km



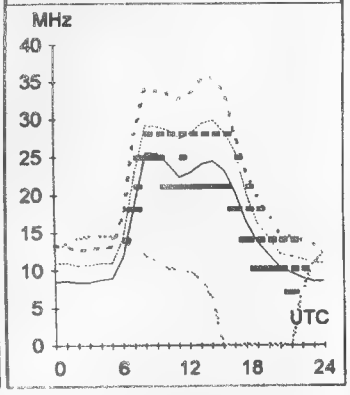
Brisbane-Pretoria 230
Second 4F3-11 4E0 Short 11655 km

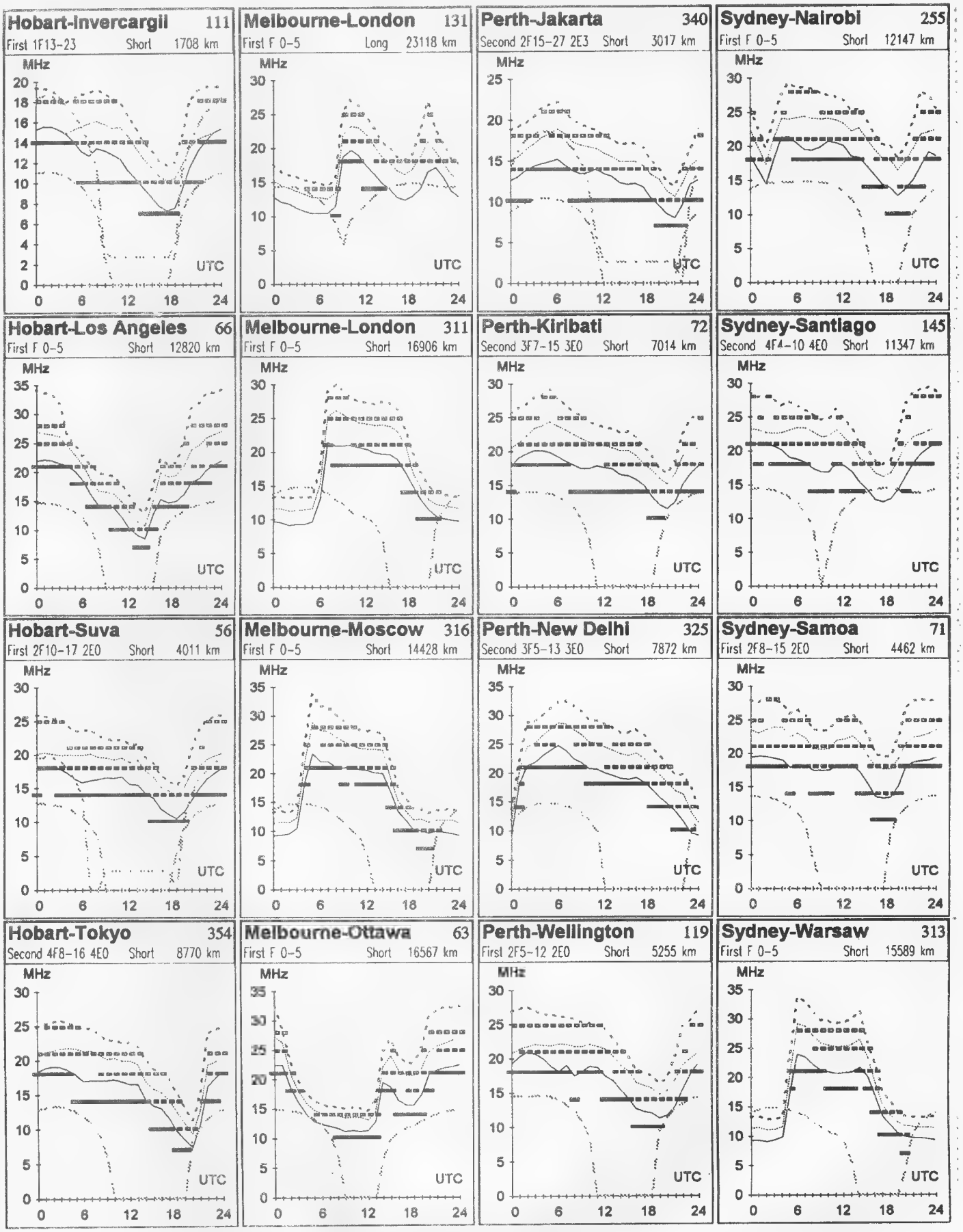


Canberra-Singapore 301
Second 3F9-18 3E0 Short 6212 km



Darwin-London 325
First F 0-5 Short 13853 km




Hobart-Invercargil 111
First 1F13-23 Short 1708 km
Melbourne-London 131
First F 0-5 Long 23118 km
Perth-Jakarta 340
Second 2F15-27 2E3 Short 3017 km
Sydney-Nairobi 255
First F 0-5 Short 12147 km
Hobart-Los Angeles 66
First F 0-5 Short 12820 km
Melbourne-London 311
First F 0-5 Short 16906 km
Perth-Kiribati 72
Second 3F7-15 3E0 Short 7014 km
Sydney-Santiago 145
Second 4F4-10 4E0 Short 11347 km
Hobart-Suva 56
First 2F10-17 2E0 Short 4011 km
Melbourne-Moscow 316
First F 0-5 Short 14428 km
Perth-New Delhi 325
Second 3F5-13 3E0 Short 7872 km
Sydney-Samoa 71
First 2F8-15 2E0 Short 4462 km
Hobart-Tokyo 354
Second 4F8-16 4E0 Short 8770 km
Melbourne-Ottawa 63
First F 0-5 Short 16567 km
Perth-Wellington 119
First 2F5-12 2E0 Short 5255 km
Sydney-Warsaw 313
First F 0-5 Short 15589 km
MHz
UTC

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- Hamads may be submitted on the form on the reverse of your current Amateur Radio address flysheet. Please print carefully, especially where case or numerals are critical.
- Please submit separate forms for For Sale and Wanted items, and be sure to include your name, address and telephone number (including STD code) if you do not use the flysheet.
- Eight lines (forty words) per issue free to all WIA members, ninth and tenth lines for name and address. Commercial rates apply for non-members.
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- QTHR means the address is correct in the current WIA Call Book.
- Ordinary Hamads from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.
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Please do not send by more than one method for any one ad or issue, it is confusing.

FOR SALE - NSW

• **Yaesu FT-101Z** HF TXCVR S/N 9C020308. G.C. Spare PA valves. Built in fan. DC-DC converter $250.00 **Kenwood TR-2400** 2m FM TXCVR S/N 0115038. Leather case, spkr mic, AC charger, car charger. G.C. $120.00 **Kenwood AT-200** antenna tuner S/N 840855 $120.00. **Dipole antenna kit** 80, 40, 20, 10m, never used. $50.00. VK2KRQ John (02) 4369 0458 12A Rickard Road Empire Bay NSW

• **Rotator Kenpro Model KR400** and control box, completely overhauled, $100. George VK2AHJ (02) 9878 2278

• **Eimac 4CX1000** Valve, breech lock socket, chimney and cathode choke $200. **BWD 881 Power Scope CRO**, unused with all probes, $500. Ray VK2FW QTHR (02) 6365 3410

• **Yaesu FT50R 2m/70cm,** hand held with leather case, large battery, hardly used, original packing, $350. Have two. David VK2BDT (02) 4821 5036

• **Power supply 240vAC to 14vDC**, 15 amps, regulated. Panel meters 0-20vDC, 0-20 amps DC. Fused primary and secondary DC outlet polarised socket, $240. Phone 02 6550 0764. VK2EJU

• **Hilltop DX site**, 360° take off. Two 18 metre towers with antennae, 1.8 MHz to 432 MHz, plus **four bedroom brick veneer and tile home**, ducted evap. cooling, off peak heating, covered outdoor area with BBQ. Contact VK2ASI, PO Box 205 Tamworth 2340. Phone (02) 6765 7947 AH.

• **Trico Digital Multi Meter** Model D703, large readout, 240 volts $50. **Leader Signal Generator** Model LSG11, $45. M Haylor VK2OW, 19 Mill St Riverstone 2765.

• **BOOK: "Radiotelegraph and Radiotelephone Codes, Prowords and Abbreviations."** 2nd Edition. $16 posted Australia. 90 Pages. Q,X,Z Codes, 97 Phonetic, 20 Morse Codes. Phillips, Myer, 10,11,12,13 Codes. Much other info. Internet - http://www.nor.com.au/community/sarc/phonetic.htm. VK2JWA, John W.Alcorn. QTHR. 02-66215217 jalcorn@nor.com.au

• **INTERNET Connect** from Port Macquarie to the Gold Coast from 80c per hour. Summerland Amateur Radio Club. For info - http://www.nor.com.au/community/sarc/sarc.htm Harry VK2XIO, QTHR, cascom@nor.com.au PO Box 293, Lismore, 2480. Ph (02) 6629 8198

WANTED NSW

• **ICOM IC-1275A Transceiver** and **IC-R7100 Receiver** in good condition. Also **Bird 43 wattmeter plugins**: 5C, 5E, 25E, 250E, 2.5K, 25K. Guy VK2KU (02) 4751 6726 any time

• **Manual/Circuit** (copy OK) for Amplifier Radio Frequency Aperiodic 1.5 - 30 Mc/s 5820-66-010-8448. The unit was built by PYE (AUST) in 1960. Data needed for display leaflet at Wyong Field Day. Expenses gladly refunded. Ian O'Toole VK2ZIO QTHR (02) 9680 2112 (A.H.) d2012pn1@ozemail.com.au

• **PACTOR I/II TNC/MODEM.** e.g. PK232MBX with firmware later than Aug 91. (Consider PK232MBX that is upgradable). e.g. KAMPLUS e.g. PTC II/IIe. e.g. Homebrew? or w.h.u. Capable of working from 12v d.c. Marine Mobile so no phone. Tel. Ken, VK4JR, for QSP, (07) 3293 0083. Email: vk2ezq@amsat.org (set transmission to "plain text format"). Packet: vk2ezq@vk5rq.#syp.#sa.aus.oc. I will tel/email/arrange sched. Can you work h.f.? 73 de Ted, VK2EZQ.

FOR SALE VIC

• **Signal Generator** HP 60BE 10-480 MHz +7(13) to -125 dBm, Precision Attenuator, including handbook $150 ono. **Marconi 801** D/8/S 10-480 MHz +4, -130 dBm Precision Attenuator $120 ono. Both good condition. David VK3XLD QTHR 03 5282 4440. Can deliver to Melbourne area.

• **Icom IC707**, as new, in box, $975. Max VK3GMM (03) 5985 2671.

• **Antennas TH6** good condition $450. 5 Element Werner Wolf on 10Mx $150, and FT7 HF mobile Ser# 8K120186 $250. Phone VK3XBG Tom on (03) 5174 6904 or write QTHR.

WANTED VIC

• **Yaesu FT757GX (or II)** in good condition preferably with service manual and power supply. Contact Graham VK3DPC QTHR 041 77 22 400 or email: graham@zendata.com.au

• **Copper Wire.** I need about 35 metres of 14 or 16 swg hard-drawn copper wire for an antenna project. Can anyone help with the wire or with a source of supply? Bill VK3HX QTHR (03) 9807 9172

FOR SALE QLD

• **Yaesu FT26 2m handheld txcvr** with 12v battery pack. Runs 5w SNo 1N171265, $200 complete with charger and car adaptor. Very good condition. Battery pack is new. Ph (07) 3408 0206 VK4LV QTHR.

• **Icom All Band HF Transceiver** Model 720A. MFJ Versa manual HF Tuner, Home Brew 20 Amp Power Supply. $500 the lot. Contact Brian VK4BOW. Ph (07) 4786 4800. Fax (07) 4786 4808 Email: bungee@tpg.com.au

• **Yaesu FT-7576 X II,** Yaesu FT-102, Yaesu FT-212RH, Yaesu FT-227R, Yaesu SP-102, **Tuners** Tokyo-Labs HC-500, Emtron EAT-300, **Receiver** Lafayette HA350, **Antennas** 10-15 CE42 Duoband (new), 10-15-20 TH3 Junior, 10-15-20 Tet-Emtron HB43DX, 10-15-20 D-4305, **Tower** 10 metre + with winch rotator, assorted items. First reasonable offer accepted. Phil VK4FPM Hervey Bay 4655 (07) 4124 1384

• **Oscilloscope D61** $100, AORSM 1-14 $420, 8-13 $30 each, earphones HI-Z STC $15, $20, Beeston $25, Brown $20, Megger Junior handcrank 500v $50, Radiotron Designers Handbook $50, Reich electron tubes $25, Eastman vacuum tubes $25, Ericsson/Trimax transformers 600/150 to 100k/25k, 600/150, 20k/5k, 40k, ea. $5. VK4APD Ph (07) 3397 3751.

• **Kenwood TS922 Linear Amplifier**. Excellent condition, $1500. VK4IK QTHR (07) 5465 6053

• **Kenwood TS-520S VGC** with mike and spare 6146 tubes, $300. Paul VK4DJ (07) 4778 6031

• **KAM+ TNC** brand new. Top of the range. Connections never been wired up. All complete with cables, plugs, manuals. Plus Host Master 11+ software, serial no 11K20-11157. New retail price listed at $799 plus software. Sell the lot incl software $600. Call June VK4SJ (07) 5492 9205, email: beau@optusnet.com.au.

FOR SALE SA

• **Yaesu FT890** HF txcvr inbuilt ATU, **Terlin Outbacker Perth** plus antenna with bonnet mount $1575. John VK5WBJ (08) 8277 0225

FOR SALE WA

• **Microwave Link** Racon Micropass 23GHz Digital 2mbps (E1) c/w orderwire and engineering channel. Full duplex operation. Shelf life only. Mint condition. $2500 Karl VK6YKD Ph (08) 9319 1130.

• **PK232MBX TNC Multimode**, ex. cond., handbook and software $250 ono. **Kenwood remote** VFO AT230 for TS830S tx/rx, mint cond. $300. Alan VK6PG QTHR (08) 9275 3348, email: vk6pg@tpg.com.au

• One **Hygain Long John No 375** five element 10 metre beam, one **Hygain Long John No 376** five element 15 metre beam, both for $150. Condition fair. On ground. Buyer to disassemble and take away. Cy VK6IK QTHR Phone (08) 9291 9128

WANTED TAS

• **8873 Conduction cooled Triode**. Phone Joe VK7JG (03) 6327 2256 Fax (03) 6327 1787 QTHR

• **Kenwood DG-5 Digital Display** for TS520S or photocopy of schematic and manual.6M SSB Transverter to suit TS-520S. Justin VK7ZTW QTHR (03) 62231351 justin@hmjgc.fam.aust.com

MISCELLANEOUS

• **Free to good home, WWII equipment**. Colonial Radio corp receiver type BC454-B, missing IF cans. AWA AT5 Oscillator Section H/F type J7750. G L Moore VK3FFX QTHR Ph (03) 9531 9301

• **I am an amateur radio operator in the Fiji Islands.** I have a small rig capable of 20w only. Therefore I wish to buy a second hand transceiver at 100-150w. I shall be most grateful if you could send me some info on the above. Ruvendra Prasad 3D2RP, PO Box 756, Nadi, Fiji Islands

TRADE ADS

• The "One Man Tower" by VK4VKD, brand new, never assembled, as it came from the factory, 10m high, $1000, • Hy Gain Beam, 10-15-20m, Explorer 14, $200, • Targa Beam, 10-15-20m, 3 El. $120, • Antenna rotator, CREATE, model RC5B-3 $300, • 23cm Yagi Group, Comet Japan, 4x52 Ele. , with matching network, $600,
• 12cm Yagi, 40 elem., Tonna, brand new, $150,
• 70cm/2m Cross Yagi System for sat-comm. $150, • Kenwood TS 50, $900, • Kenwood TS 440S, looks bad, but works OK, $500, • 2 3 c m Lin Amp, TLA 1270-100, 100 Watt out, from SSB Electronic Germany, $ 1,500, • 70cm Lin Amp, TLA 432-100, 100 Watt out, $500,
• 70cm Lin Amp, TLA 432-200, 200 Watt out, $1000, • Pactor Controller SCS, PTC-2, $1,100,
• Icom IC 1271E, 23cm All mode TRX, $ 1000,
• Icom IC 275H, 100 Watt 2m All mode, $ 800,
• LT 6 S, 50 MHz Transverter, SSB Electronic, new, $700, • TWE Mobile-HF-Amplifier MA 500, 600 Watt, $700, • Metron Mobile-HF-Amplifier MA 1000, $900, • Mikrofon Icom SM 8, $100, • Diamond SWR Meter SX 1000, 4 Bands, 1,8 - 1300 Mc, new, $200, • MFJ 249 Antenna Tester, battery braket defect, $100,
• Lots of Pre-amps from SSB Electronic, for 12cm, 23cm, 70cm - 2m - 6m
• -also Converters etc., pse ask.
Walter in Perth, VK6BCP, (08) 9341 2054, e-mail: vk6bcp@arrl.net

• **AMIDON FERROMAGNETIC CORES:** For all RF applications. Send business size SASE for data/price to RJ & US Imports, PO Box 431, Kiama NSW 2533 (no enquiries at office please ... 14 Boanyo Ave Kiama). <www.cyberelectric.net.au/~rjandusimports> Agencies at: Assoc TV Service, Hobart: Truscotts Electronic World, Melbourne and Mildura: Alpha Tango Products, Perth: Haven Electronics, Nowra

• **WEATHER FAX programs** for IBM XT/ATs *** "RADFAXZ" $35.00, is a high resolution short-wave weather fax, Morse and RTTY receiving program. Suitable for CGA, EGA, VGA and Hercules cards (state which). Needs SSB HF radio and RADFAX decoder. *** "SATFAX" $45.00, is a NOAA, Meteor and GMS weather satellite picture receiving program. Needs EGA or VGA & WEATHER FAX PC card, + 137 MHz Receiver. *** "MAXISAT" $75.00 is similar to SATFAX but needs 2 MB of expanded memory (EMS 3.6 or 4.0) and 1024 x 768 SVGA card. All programs are on 5.25" or 3.5" disks (state which) plus documentation, add $3.00 postage. ONLY from M. Delahunty, 42 Villers St, New Farm QLD 4005. Ph 07 358 2785.

http://www.hamsearch.com
a not-for-profit site that is a search engine for hams

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Our Hamad typist is not an expert in your field.

Please write legibly on your form, in capitals and lowercase, and use legitimate abbreviations.

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WIA Division Directory

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually in their residential State or Territory, and each Division looks after amateur radio affairs within its area.

Division	Address	Officers		News Broadcasts Note: All times are local. All frequencies MHz.	Fees	
VK1 ACT Division GPO Box 600 Canberra ACT 2601	President Secretary Treasurer	Gilbert Hughes John Woolner Les Davey	VK1GH VK1ET VK1LD	VK1WI: 3.570 LSB, 146.950 FM each Sunday evening from 8.00pm local time. The broadcast text is available on packet, on Internet *aus.radio.amateur.misc* news group, and on the VK1 Home Page http://www.vk1.wia.ampr.org	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK2 NSW Division 109 Wigram St Parramatta NSW (Office hours Mon-Fri 1100-1400) (PO Box 1066, Parramatta 2124) Phone 02 9689 2417 Freecall 1800 817 644 Fax 02 9633 1525	President Secretary Treasurer Web: *http://marconi.mpce.mq.edu.au/wia* e-mail: *vk2wi@ozemail.com.au*	Michael Corbin Eric Fossey Eric Van De Weyer	VK2YC VK2EFY VK2KUR	From VK2WI 1.845, 3.595, 7.146*, 10.125, 14.160, 24.950, 28.320, 29.120, 52.120, 52.525, 144.150, 147.000, 438.525, 1281.750 (* morning only) with relays to some of 18.120, 21.170, 584.750 ATV sound. Many country regions relay on 2 m or 70 cm repeaters. Sunday at 1000 and 1930. Highlights included in VK2AWX Newcastle news, Monday 1930 on 3.593 plus 10 m, 2 m, 70 cm, 23 cm. The broadcast text is available on the Internet newsgroup *aus.radio.amateur.misc*, and on packet radio.	(F) (G) (S) (X)	$69.00 $56.00 $41.00
VK3 Victorian Division 40G Victory Boulevard Ashburton VIC 3147 (Office hours Tue & Thur 0830-1530) Phone 03 9885 9261 Fax 03 9885 9298	President CEO Secretary Web: *http://www.tbsa.com.au/~wiavic/* e-mail: *vk3wi@rint.com.au*	Jim Linton Barry Wilton Peter Mill	VK3PC VK3XV VK3APO	VK3BWI broadcasts on the 1st and 3rd Sunday of the month at 8.00pm. Primary frequencies, 3.615 LSB, 7.085 LSB, and FM(R)s VK3RML 146.700, VK3RMM 147.250, VK3RWG 147.225, and 70 cm FM(R)s VK3ROU 438.225, and VK3RMU 438.075. Major news under call VK3WI on Victorian packet BBS and WIA VIC Web Site.	(F) (G) (S) (X)	$75.00 $61.00 $47.00
VK4 Queensland Division GPO Box 638 Brisbane QLD 4001 Phone 07 5496 4714	President Secretary Treasurer e-mail: *wiaq@brisbane.dialix.com.au* Web: *http://www.wiaq.powerup.com.au*	Colin Gladstone Peter Harding Alistair Elrick	VK4ACG VK4JPH VK4FTL	VK4WIA: 1.825 MHz SSB, 3.605 MHz SSB, 7.118 MHz SSB, 14.342 MHz SSB, 21.175 MHz, 28.400 MHz SSB, 29.220 MHz FM, 53.725 MHz FM, 147.000 MHz FM, 438.500 MHz (Brisbane only), and regional VHF/UHF repeaters at 0900 hrs EAST Sunday. Repeated on 3.605 MHz SSB & 147.000 MHz FM at 1930 hrs EAST Monday. Broadcast news in text form on packet under WIAQ@VKNET.	(F) (G) (S) (X)	$85.00 $72.00 $56.00
VK5 South Australian Division (GPO Box 1234 Adelaide SA 5001) Phone 08 8294 2992	President Secretary Treasurer	Jim McLachlan David Minchin John Butler	VK5NB VK5KK VK5NX	VK5WI: 1827 kHz AM, 3.550 MHz LSB, 7.095 AM, 14.175 USB, 28.470 USB, 53.100 FM, 147.000 FM Adelaide, 146.700 FM Mid North, 146.800 FM Mildura, 146.825 FM Barossa Valley, 146.900 FM South East, 146.925 FM Central North, 147.825 FM Gawler, 438.425 FM Barossa Valley, 438.475 FM Adelaide North, ATV Ch 35 579.250 Adelaide. (NT) 3.555 USB, 7.065 USB, 10.125 USB, 146.700 FM, 0900 hrs Sunday. 3.585 MHz and 146.675 MHz FM Adelaide, 1930 hrs Monday.	(F) (G) (S) (X)	$77.00 $63.00 $49.00
VK6 West Australian Division PO Box 10 West Perth WA 6872 Phone 08 9351 8873	Acting Pres. Secretary Treasurer Web: *http://www.faroc.com.au/~vk6wia/* e-mail: *vk6wia@faroc.com.au*	Cliff Bastin Christine Bastin Bruce Hedland-Thomas	VK6LZ VK6ZLZ VK6OO	VK6WIA: 146.700 FM(R) Perth at 0930hrs Sunday relayed on 1.825, 3.560, 7.075, 14.116, 14.175, 21.185, 29.680 FM, 50.150 and 438.525 MHz, country relays 3.582, 147.200 (R) Cataby, 147.350 (R) Busselton and 146.900 (R) Mt William (Bunbury). Broadcast repeated on 146.700 at 1900 hrs Sunday relayed on 1.865, 3.563 and 438.525 MHz : country relays on 146.350 and 146.900 MHz.	(F) (G) (S) (X)	$69.00 $59.00 $38.00
VK7 Tasmanian Division PO Box 271 Riverside TAS 7250 Phone 03 6425 2923 Fax 03 6425 2923	President Secretary Treasurer Web: *http://www.wia.tasnet.net*	Ron Churcher Tony Bedelph John Bates	VK7RN VK7AX VK7RT	VK7WI: 146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.725 (VK7RNE), 146.625 (VK7RMD), 3.570, 7.090, 14.130, 52.100, 144.150 (Hobart), repeated Tues 3.590 at 1930 hrs.	(F) (G) (S) (X)	$88.00 $75.00 $55.00

VK8 Northern Territory (part of the VK5 Division and relays broadcasts from VK5 as shown, received on 14 or 28 MHz).

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